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Mechanisms of Mindfulness and the Treatment of Social Anxiety: A
Randomized Controlled Trial of Brief Mindfulness Training for Socially
Anxious Adults

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ABSTRACT

Research suggests that the information processing style of socially anxious adults is characterised by distorted attention and negative interpretations of social experiences. This processing style results in anxious emotions and social avoidance and may be altered by an intervention approach such as mindfulness, which directly addresses aspects of information processing. Despite a recent proliferation of mindfulness-based therapies, the mechanisms underpinning the effectiveness of these are not well understood. The purpose of the current research was to investigate the efficacy of a brief mindfulness intervention for socially anxious adults in such a way that potential mechanisms of change could be explored.

The main study was a randomized controlled trial (RCT) of a brief mindfulness intervention for socially anxious adults. In study phase 1 a community sample ($N = 388$) was surveyed with the Fear of Negative Evaluation survey to establish inclusion criteria for the RCT. In study phase 2 the acceptability of RCT measures, materials and intervention protocols were assessed via a pilot study. In study phase 3 interested potential RCT participants were screened for eligibility. In study phase 4 a RCT compared the efficacy of brief mindfulness training as an intervention approach for socially anxious adults to progressive relaxation training and a wait-list control condition. Seventy-nine socially anxious university students and community adults were allocated to one of three conditions (mindfulness, relaxation, or wait-list control) and attended an initial training session and an experimental session 4 weeks later. Participants in intervention conditions (mindfulness and relaxation) practiced their technique at home between sessions. Pre and post-measures assessed change to mindfulness, social anxiety and potential mindfulness mechanisms (attention, decentering, emotional and behavioural regulation, and self-compassion). Although both mindfulness and relaxation training were associated with increased self-compassion and mindful awareness of painful experiences, mindfulness training was uniquely associated with; reduced social avoidance and distress, reduced rumination and less feelings of isolation from others during distress. In addition, mindfulness participants managed a stressful situation by using more positive self-statements than other groups. Brief mindfulness training was perceived by participants as an

effective and acceptable intervention and may be an effective low cost technique for reducing social anxiety.

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*This thesis is dedicated to Max, who came on this journey without a choice, and who was,
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CHAPTER 1

INTRODUCTION

Social anxiety is a highly prevalent and distressing psychological disorder (Fehm, Pelissolo, Furmark, & Wittchen, 2005; Wells, 2006; Wittchen, Stein, & Kessler, 1999). It is characterised by a distinctive pattern of information processing which includes high levels of self-focussed attention in conjunction with hyper-vigilance for social threat and interpretative biases toward social failure and criticism from others (Roth, 2004). Although the efficacy of cognitive behavioural treatments for social anxiety have been demonstrated (Heimberg, Dodge, Hope, Kennedy, & et al., 1990; Hope, Heimberg, & Bruch, 1995), a significant number of sufferers show minimal responsiveness to treatment (Hofmann & Bogels, 2006). New approaches that address this discrepancy are currently being considered.

Mindfulness is one such approach. Mindfulness-based therapies have proliferated in the last two decades. Preliminary data suggest that these are efficacious in treating a wide range of difficulties; however, the mechanisms by which mindfulness elicits change are not clear (Baer, 2003). Attentional changes, decentering processes, changes to emotional and behavioural regulation as well as self-compassion have been hypothesised to reduce distress and promote adaptive functioning (Baer, 2010). Such change mechanisms may support the management of social anxiety by reducing self-focussed attention and hyper-vigilance, altering the subjective experience of biased cognitions and supporting regulation of both anxious emotions and avoidance behaviours within the context of a compassionate caring attitude toward the self. The purpose of this study was to explore the acceptability and efficacy of a mindfulness-based intervention for social anxiety whilst investigating possible mechanisms underpinning any change.

Chapter 2 of this thesis presents background information on the prevalence, impact and etiology of social anxiety before outlining a cognitive model of information processing in social anxiety and discussing current treatment approaches and their limitations. Mindfulness

is defined in chapter 3 and its application within mindfulness-based therapies discussed. Hypothesised mindfulness mechanisms of attentional change, decentering, emotional and behavioural regulation as well as self-compassion are also described within this chapter and literature supporting these mechanisms is reviewed. Chapter 4 outlines the ways in which mindfulness may support the management of social anxiety. Previous studies of mindfulness training as an intervention for social anxiety are discussed and the relationship between potential mechanisms of mindfulness and information processing in social anxiety is considered. It is argued that, through mindfulness training these mechanisms may lead to changes in information processing, which in turn reduce the experience of social anxiety.

The purpose and specific aims of this study are outlined in chapter 5. This study sought to demonstrate whether mindfulness training could be provided briefly to socially anxious participants in a way that was useful and acceptable to them, and supported the management of social anxiety. In addition, it sought to explore whether mindfulness training resulted in changes to mechanisms with the potential to modify information processing in social anxiety.

The main study was a randomized controlled trial (RCT) of the effectiveness of a mindfulness intervention in reducing experiences of social anxiety. However, prior to commencing this study several preliminary studies were conducted to establish inclusion criteria for the RCT; evaluate the acceptability of RCT measures, materials and interventions, and screen interested potential participants for eligibility. A methodological overview of these preliminary studies and the RCT is presented in chapter 6.

Chapter 7 describes the methods and results of study phase 1. The purpose of this phase of the research was to establish an appropriate criterion score for the RCT by surveying undergraduate psychology students from the University of Auckland with the Fear of Negative Evaluation survey (FNE). An upper quartile cut-off score for this measure was established. The results of this study are discussed in relation to other research reviewing normative properties of the FNE.

Study phase 2 assessed the acceptability of measures, and mindfulness and relaxation intervention protocols to be used in the RCT. Measures and protocols were assessed via a pilot study, and a separate pilot test assessing the comparability in acceptability and quality of mindfulness and relaxation audio recordings. Methods and results of this phase of the research are presented in chapter 8.

Chapter 9 describes the methods and results of study phase 3. In this phase of the research individuals interested in participating in the RCT completed an online screening tool designed to identify eligible participants for the RCT. This tool included the FNE and measures of mindful awareness, rumination after a social event, self-compassion, and life satisfaction as well as a demographic measure. Data collected from study phase 3 were analysed to assess relationships between variables typically associated with mindfulness (i.e., mindful awareness, self-compassion, life satisfaction) and social anxiety (i.e., fear of negative evaluation, rumination after a social event), as well as the relationships of each type of variable to various demographic characteristics. This data was also analysed to compare scores on measures associated with mindfulness and social anxiety, and demographic characteristics for qualifying potential participants who did and did not choose to participate in the RCT. The implications of these analyses are discussed and limitations of this phase of the research reviewed at the end of chapter 9.

The methodology used in the RCT is presented in chapter 10. Participants in the RCT were allocated to one of 3 conditions; mindfulness, relaxation or wait list control. They attended an initial training session and an experimental session 4 weeks later. Participants in intervention conditions (mindfulness and relaxation) practiced their technique at home between sessions. Pre and post measures assessed change across several dimensions including mindfulness, social anxiety, attention, decentering, regulation of emotion and behaviour and self compassion. The results of the RCT are presented in chapter 11 and discussed in chapter 12. Chapter 12 also provides a final discussion of the role for mindfulness training in the management of social anxiety, and considers limitations of this study and future directions for this field of research. Finally, chapter 12 provides an overall discussion of the thesis and four

study phases. Specifically it considers how these studies suggest that a brief mindfulness intervention generates changes relevant to information processing in social anxiety and contribute to current the arena of mindfulness as an a treatment for social anxiety.

CHAPTER 2

SOCIAL ANXIETY

Overview

Individuals who experience social anxiety fear negative appraisals from others in social or performance situations (Roth, 2004). Consequently, they may fear situations such as speaking in public, meeting new people, talking to people in authority or working under observation. As a result of this fear, socially anxious individuals may experience somatic symptoms such as blushing and sweating; cognitive symptoms such as intrusive negative thoughts and difficulty concentrating; and behavioural symptoms including avoidance of social situations (Roth Ledley & Heimberg, 2006).

Social anxiety encompasses a spectrum of social discomfort ranging from shyness and other transient experiences of social anxiety to clinically significant social anxiety disorder and avoidant personality disorder (Muller, Koen, & Stein, 2004). The literature reviewed for the current research includes studies of both clinical populations experiencing social anxiety disorder (e.g., Foa, Gliboa-Schechtman, Amir & Freshman, 2000) and non-clinical populations, classified as high in social anxiety on the basis of their scores on self-report measures (e.g., Mansell, Ehlers, Clark & Chen, 2002). Participants in the RCT for this thesis were recruited from the general public and included on the basis that their score on the FNE survey fell above an upper quartile cut-off. This analogous approach to studying social anxiety disorder is supported by evidence that both clinical and non-clinical socially anxious groups present with a comparable pattern of information processing, distinguishable from non-anxious controls (Stopa & Clark, 2001). Information about the processing style and treatment responses of both clinical and non-clinical socially anxious populations may provide insight on ways to reduce distress associated with social anxiety.

This chapter provides a definition of social anxiety disorder and background information on its prevalence and impact. The prevalence and impact of social anxiety in the general

population is also discussed and the etiology of social anxiety is reviewed. Cognitive models of social anxiety are presented and an overall cognitive framework for understanding information processing in social anxiety is outlined. Finally, treatment approaches to social anxiety are presented and the limitations of these are considered. The need for a new approach that addresses multiple elements of information processing in social anxiety is discussed.

Social Anxiety Disorder

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2000) defines social anxiety disorder as a strong and persistent fear about behaviour or anxiety symptoms in social or performance situations. It notes that exposure to feared situations consistently causes anxiety, and that although sufferers are aware their fear is excessive, they either avoid feared situations, or endure them with distress. The anxiety interferes significantly with functioning or causes considerable distress, and for individuals younger than 18 years, the symptoms should have persisted for at least 6 months. Fear or avoidance behaviours stemming from the effects of a substance or a medical condition, or which are better accounted for by another mental disorder do not contribute to a diagnosis of social anxiety disorder. The DSM-IV-TR also enables a specification of either generalized or non-generalized social anxiety disorder, depending on the universality of the fear. If the individual fears most social situations then the disorder is classified as generalised. In non-generalised social anxiety disorder the individual is likely to fear only a limited number of situations. A differential diagnosis for avoidant personality disorder (APD) is set out within the DSM-IV. APD is a form of personality disorder and may represent the more extreme end of the same spectrum of problems (Muller et al., 2004).

Prevalence of Social Anxiety Disorder

Internationally, lifetime prevalence rates for social anxiety disorder range from 4.9% (e.g., for males in a sample of 14 -24 year olds in Munich, Wittchen et al., 1999) to 13.3% (e.g., in a United States national population survey, Kessler, McGonagle, Zhao, et al., 1994).

Globally, social phobia is more prevalent among women than men (Fehm et al., 2005). In a Ministry of Health survey of the New Zealand population the 12 month prevalence rate for social anxiety disorder was 5.1% (Wells, 2006). This rate was higher for Maori (6.2%; Baxter, Kingi, & Tapsell, 2006) and Pacific People (5.6%; (Foliaki, Kokaua, Schaaf, & Tukuitonga, 2006). Twelve month prevalence rates were highest for younger age groups (7.0% for 16 to 24 year olds) and decreased throughout the age brackets, occurring much less often in older adults (1.4% for those 65 and over). The lifetime prevalence rate of social anxiety disorder for the entire sample was 9.4% (Oakley Browne, 2006). This rate was higher for women (10.1%) than for men (8.7%), and higher again for Maori (11.4%) ((Baxter, Kingi, & Tapsell, 2006). For Pacific People the lifetime prevalence rate was 10.0% (Foliaki et al., 2006). Social anxiety disorder was the second most prevalent anxiety disorder in the survey after specific phobia (Oakley Browne, 2006).

Impact of Social Anxiety Disorder

Social anxiety disorder often leads to negative outcomes across a range of social domains including friendships, romantic relationships and family functioning (Fehm et al., 2005; Merikangas, Avenevoli, Acharyya, Zhang, & Angst, 2002; Wittchen, Fuetsch, Sonntag, Muller, & Liebowitz, 2000). It is also associated with difficulties in educational and employment settings (Fehm et al., 2005; Wittchen et al., 2000). Individuals with social anxiety disorder often leave school earlier and achieve lower levels of educational attainment than those without the disorder (Fehm et al., 2005). They are also more likely to be unemployed, miss days of work, or be employed below the level of their qualifications (Fehm et al., 2005; Wittchen et al., 2000).

Co-morbidity with other disorders is very common, with rates of lifetime co-morbidity as high as 92% being reported (Fehm et al., 2005). It is often comorbid with depressive disorders, other anxiety disorders and substance use disorders (Fehm et al., 2005). Social anxiety disorder appears to precede both major depression and alcohol abuse in cases of co-morbidity which suggests that it may be a risk factor for both (Fehm et al., 2005).

Hambrick, Turk, Heimberg, Schneier, & Liebowitz (2003) investigated disability and quality of life among sufferers of social anxiety disorder. They found that the two constructs were distinct and only overlapped slightly, suggesting that the symptoms of social anxiety may result in reduced life satisfaction irrespective of the amount of disability actually experienced (Hambrick et al., 2003).

Research conducted in Europe suggests that social anxiety disorder, with or without co-morbid depression is associated with an increased risk of suicidal behaviour (Fehm et al., 2005). In New Zealand 17.2% of those with social anxiety disorder will consider taking their own lives and 2.1% will carry out an attempt to do so (Beautrais, 2006).

Social Anxiety in the General Population

A distinction is often drawn between social anxiety disorder and non-clinical but intrusive levels of social anxiety. Many individuals experience anxiety when in situations in which they wish to be evaluated positively by others (Ronald M Rapee & Spence, 2004). Some anxiety in social situations is normal and adaptive since it motivates individuals to present themselves in an acceptable way (Widiger, 2001). Despite this, numerous studies suggest that some of those who experience sub-clinical social anxiety still experience intrusive levels of impairment (Davidson, Hughes, George, & Blazer, 1994; Dell'Osso et al., 2003; Essau, Conradt, & Petermann, 1999; Merikangas et al., 2002). A sub-group of individuals reporting social anxiety symptoms that do not meet DSM-IV-TR criteria have been identified as having more problems with work attendance, lower income, less education, poorer school performance and attendance, less close friendships, poorer self confidence, and greater use of psychotropic drugs than those not experiencing social anxiety (Davidson et al., 1994; Dell'Osso et al., 2003). Although the information processing style of sub-clinical socially anxious populations and those with social anxiety disorder is likely to be similar (Roth Ledley & Heimberg, 2006) it is not yet known whether treatment approaches for social anxiety disorder could alleviate distress and improve functioning for this sub-threshold group.

Etiology of Social Anxiety

Because the age of onset for social anxiety is early (typically 12 -17 years of age; Fehm et al, 2005) it can be difficult to trace factors that have led to its development (Ledley & Heimberg, 2006). Although a model of the etiology for social anxiety has not been empirically validated, several theories have been proposed (Fehm et al., 2005). These include the possible role of genetics, infant temperament, attachment style, experiences of childhood abuse and a parent's own social anxiety.

Genetic and Biological Factors

Data from twin studies has been interpreted as evidence that genetic factors contribute to the development of social anxiety (Beatty, Heisel, Hall, Levine, & La France, 2002). Rapee and Spence (2004) note that genes may increase the risk of emotional disorders generally rather than impacting specifically on social concerns. In this way genetic factors could lead to an increase in reactivity to stimuli or behavioural inhibition, two temperamental features associated with later anxiety. Twin studies may not provide straightforward evidence of genetic heritability however (Joseph, 2002). These studies are based on an assumption that monozygotic and fraternal twins share equivalent environments and that higher concordance rates of a specified trait in monozygotic twins reflect a greater genetic influence on that trait. The assumption of equivalent environments is problematic however as monozygotic twins may share more similar environments as a result of their more similar appearance, family and others treating them more similarly and a closer emotional relationship. These environmental factors may contribute to the higher concordance rates found among monozygotic twins (Joseph, 2002).

Differences in the operation of neurotransmitters within the neurochemical systems of those who do and do not experience social anxiety have been hypothesised to provide a biological basis for differences in phenotype (Rapee & Spence, 2004). Support for this hypothesis has been inconsistent however. Some authors have reported evidence of possible differences in the serotonergic systems of individuals with social anxiety (Arbelle et al., 2003), some have

reported differences in dopamine functioning (Rowe et al., 1998), and others have found no differences at all (Schmidt, Fox, Rubin, Hu, & Hamer, 2002). These inconsistencies, combined with data demonstrating that environmental factors and life experiences can shape neurological systems (Read, Perry, Moskowitz, & Connolly, 2001), suggest that biological contributions to the etiology of social anxiety are still not well understood.

Infant Temperament

The relationship between temperament and social anxiety has been examined in both infants and children. Temperament describes characteristic behavioural patterns and may be influenced by both biological and environmental factors (Kagan, 2001). Research suggests that infants who are highly reactive to new stimuli, and children who are withdrawn or behaviourally inhibited in novel situations, are more likely to experience later anxiety (Kagan, 2001). Roth Ledley and Heimberg (2006) suggest that highly sensitive infants might find adults frightening and avoid looking at their faces until this becomes habitual. As a result they might not learn skills to connect with people or fail to observe positive non-threatening facial expressions. Similarly, they suggest that reactive infants may deter adult contact by crying and appearing fearful, resulting in less social experiences and a belief that these are frightening.

Attachment Style

Attachment style between parent and infant may also play a role in the development of social anxiety (Roth Ledley & Heimberg, 2006). Attachment style may form the basis for the infant's understanding of their social world; infants who are not securely attached to their parents may not feel secure in future relationships, or see others as critical or unreliable. Insecure attachment patterns have been associated with shyness and social anxiety later in childhood and adulthood (Bohlin, Hagekull, & Rydell, 2000; Eng, Heimberg, Hart, Schneier, & Liebowitz, 2001; Mickelson, Kessler, & Shaver, 1997). Similarly relationships have been found between parental unavailability and social anxiety (Chartier, Walker, & Stein, 2001; Wittchen et al., 1999).

Childhood Abuse

Experiences of childhood abuse and neglect have been associated with the development of social anxiety. In a sample of 103 adults with social anxiety disorder 70% reported childhood abuse or neglect as measured by the Childhood Trauma Questionnaire (Simon et al., 2009). Associations were found between symptom severity and emotional neglect and abuse in particular. In addition, associations have been found between childhood sexual abuse and social anxiety disorder in both men and women (Cogle, Timpano, Sachs-Ericsson, Keough, & Riccardi, 2010). Experiences of childhood abuse may form the basis for cognitive assumptions that underpin social anxiety, for example believing that one is flawed or that others are likely to be critical.

Parental Anxiety

A parental history of shyness or social anxiety has also been associated with the development of social anxiety (L. Alden & Cappe, 1988; Bogels, van Oosten, Muris, & Smulders, 2001; Tillfors, Furmark, Ekselius, & Fredrikson, 2001). Bogels and colleagues (2001) found that low levels of family sociability correlated with social anxiety in childhood. Roth Ledley and Heimberg (2006) suggest that by being socially isolated themselves, socially anxious parents may present their children with fewer opportunities to interact with others and learn that social interactions can be enjoyable. They also note that socially anxious parents may convey to their children that the social world is dangerous, increasing their vigilance for social threat.

While these studies provide information on contextual factors that may contribute to the development of social anxiety they do not provide limited understanding of the psychological factors, such as information processing style, that maintain social anxiety. Information on cognitive processing in social anxiety provides a basis for understanding which maintaining factors may be amenable to psychological treatment.

Cognitive Models of Social Anxiety

Cognitive models of social anxiety provide a format for understanding the distinctive pattern of information processing which appears to maintain social anxiety (Clark, 2001; Ledley & Heimberg, 2006). Studies have demonstrated that socially anxious individuals typically present with a cognitive and attentional style that differs those without social anxiety, in the context of processing socially relevant information (Ledley & Heimberg, 2006). Cognitive models of social anxiety have been proposed by both Clark and Wells (Clark & Wells, 1995) and Rapee and Heimberg (Ronald M Rapee & Heimberg, 1997).

Clark and Wells Model

Clark and Wells (1995) proposed the first cognitive model of processes maintaining social anxiety (depicted in figure 1). According to this model assumptions about the self and social world are activated for the socially anxious individual upon entering a social situation, and these assumptions comprise three main kinds of beliefs. Firstly, socially anxious individuals may believe it is necessary to maintain extremely high standards of social behaviour (e.g., not stumbling on any words during an oral presentation). Secondly, they may believe that negative outcomes would be likely to occur if they failed to meet high standards of social behaviour, and that the cost of these outcomes would be very high (e.g., stumbling during a presentation might lead to failing a course completely). Thirdly they may have negative beliefs about themselves, believing that they are socially flawed in some way (e.g., that they are weird or unlikeable). Clark and Wells suggests that as a result of these beliefs socially anxious individuals are more likely to perceive the social world as a hostile place and to experience a number of symptoms related to perceived social danger when they are in a social situation. These symptoms might include physical symptoms of anxiety like sweating, blushing or shaking; or cognitive symptoms such as poor concentration. Self-focussed attention increases in response to anxiety symptoms and attention to the social situation reduces as socially anxious individuals attend to both how they are feeling and how they are being perceived by others (Bond & Omar, 1990; Mellings & Alden, 2000).

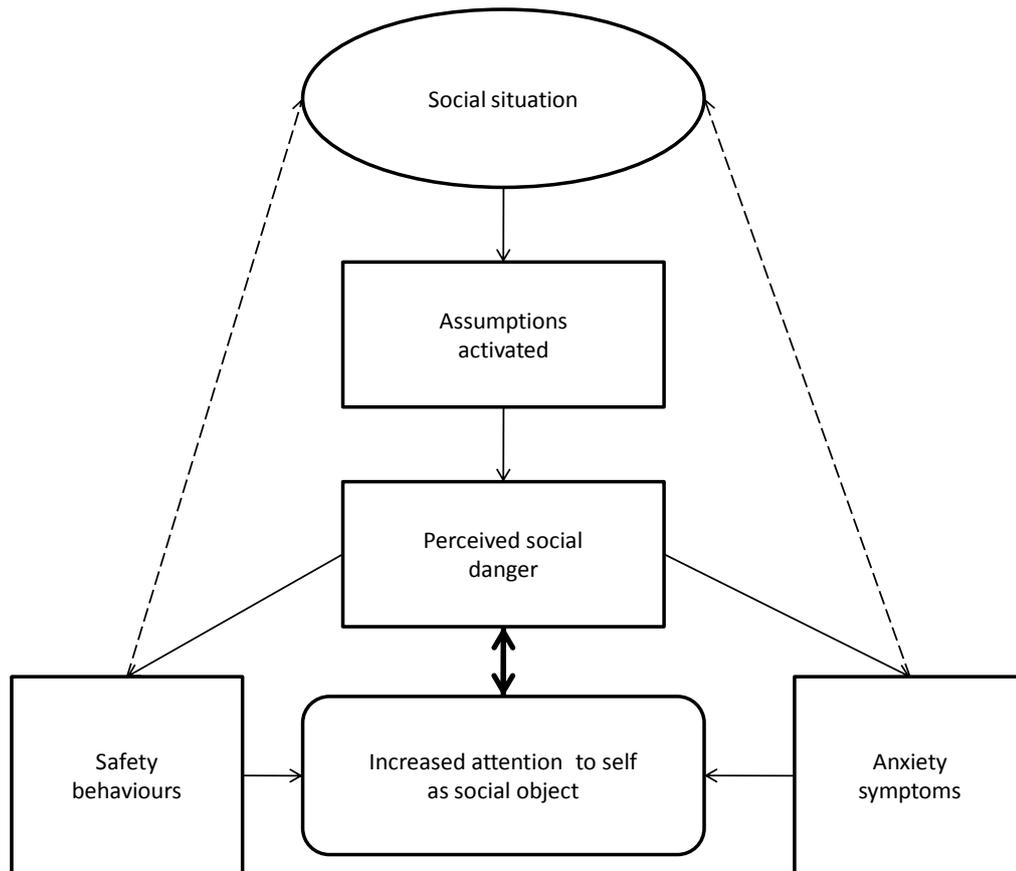


Figure 1. Cognitive model of processes hypothesised to occur when a socially anxious individual enters a social situation. Adapted from Clark and Wells (1995)

A shift to self focussed attention can have a number of negative consequences (Clark & Wells, 1995). Awareness of anxiety symptoms may be heightened, potentially exacerbating the severity and duration of the symptoms (e.g., focussing on sensations of a racing heart may prompt greater anxiety and cause the heart to race faster). By focussing attention on themselves the individual may also have less ability to process information about the social situation and may miss out on information in the environment that disconfirms their fears (e.g., an attentive audience during a speech). In addition high levels of self-focussed attention may cause the individual to come across as unfriendly, increasing the likelihood of negative social experiences. Since high levels of self-focussed attention make it difficult for

individuals with social anxiety to process information about the social situation, they might make assumptions about how they performed on the basis of how they felt. This process of reasoning on the basis of a 'felt-sense' has also been identified in individuals with depression (Teasdale & Barnard, 1993). This emotional reasoning style may lead them to inaccurately conclude that since they *felt* bad their performance *was* bad.

Clark and Wells's model also proposes that social anxiety might be maintained by the use of safety behaviours. These are avoidance behaviours that may help socially anxious individuals feel more able to cope in a social situation, for example, not contributing to a conversation for fear of stumbling over words. These avoidance behaviours serve to reduce anxiety and are therefore likely to be maintained as part of the individual's behavioural repertoire. By repeatedly engaging in these behaviours opportunities to trial new behaviours and observe their outcomes are missed. For example, by contributing to the conversation the individual may observe either that he does not stumble over words, or that if he does, he is not rejected by others

Finally, Clark and Wells suggest that social anxiety may also be maintained by anxiety experienced before and after the social event. Anxiety experienced prior to the event may cause the individual to expect the worst. As a result they may monitor their own behaviour more closely; increasing self-focussed attention and exacerbating anxiety. After the event is over the individual may ruminate over their social behaviour. This may lead to the encoding of strong, but inaccurate memories of social failure, which are in turn activated during future social events.

Rapee and Heimberg's Model

Rapee and Heimberg (1997) have also proposed a cognitive model of social anxiety (depicted in figure 2). They suggest that social anxiety arises because the individual believes both that it is extremely important to make a good impression on others and that other people

are very critical. As a result, upon entering a social situation, the socially anxious individual creates a mental representation of themselves as they believe others see them, which they compare to standards they believe others expect of them. Perceived discrepancies lead to further anxiety and increases in behavioural, cognitive and physical symptoms of anxiety. Rapee and Heimberg also suggest that the allocation of attention alters as a result of this anxiety so that the socially anxious individual attends predominantly to their experience of anxiety and any external evidence which might suggest that they are being evaluated negatively.

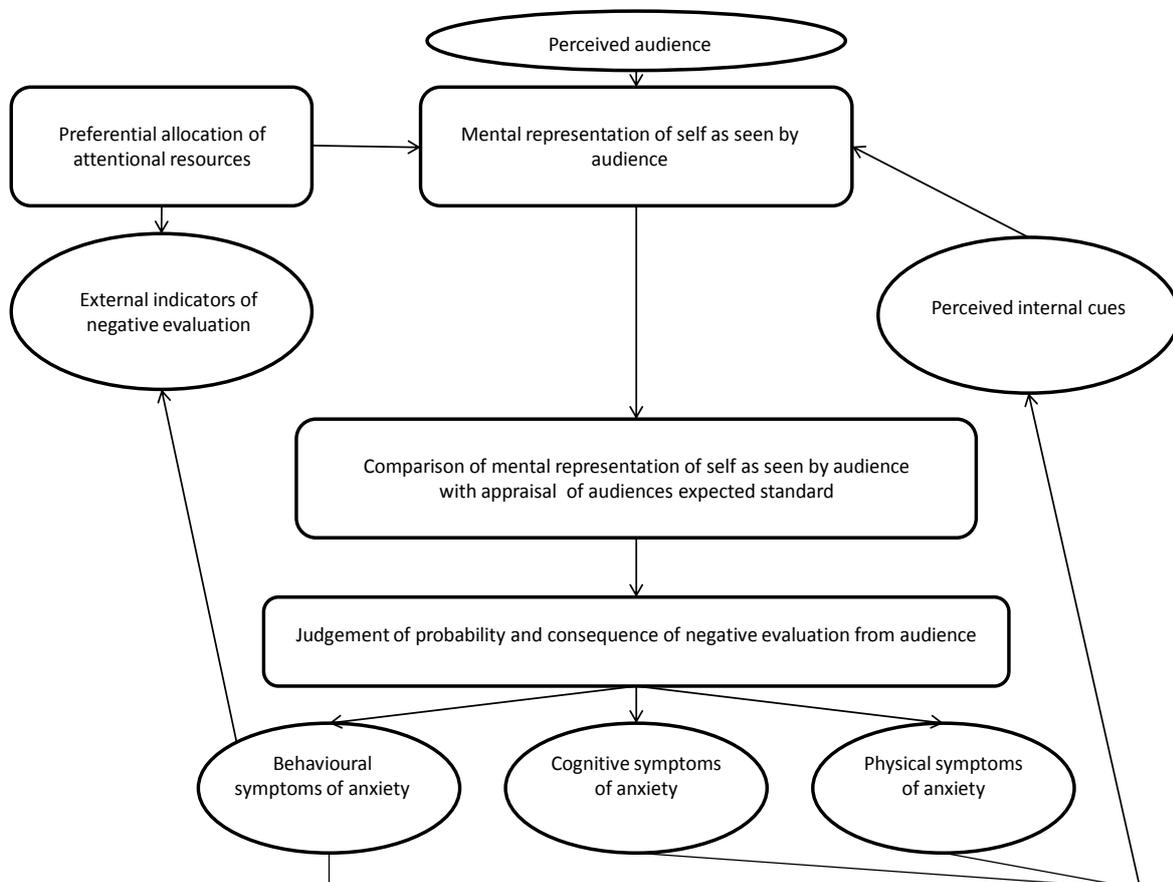


Figure 2. Cognitive model of the generation and maintenance of anxiety in social situations. Adapted from Rapee and Heimberg (1997)

Key Features of Cognitive Models

Both Clark and Wells' (1995) and Rapee and Heimberg's (1997) cognitive models share key characteristics. Both suggest that the individual's assumptions about themselves and the social world are activated when they enter a social situation, and that this in turn triggers a shift in attention towards the self. This change in self-processing may alter the way in which information is processed so that attention, memory and cognitive interpretations are biased towards evidence of social failure. Numerous studies indicate that socially anxious individuals are more likely than others to engage in this cognitive processing style (Ledley & Heimberg, 2006; Roth, 2004). In the following sections evidence supporting these common aspects; negative assumptions about the self and the social world, increased self focussed attention, and biased information processing, is presented and reviewed.

Negative Assumptions about the Self and the Social World

Studies have demonstrated that socially anxious individuals are more critical of their social behaviour than non-anxious controls. In a study of 32 patients with social anxiety disorder and 32 matched non-clinical controls Alden and Wallace (1995) found that socially phobic participants were more likely than controls to judge their behaviour negatively in both negative and positive social interactions with an experimental assistant of the opposite sex. Similarly, Stopa and Clark (1993) found that participants with social anxiety disorder had more negative self-appraisals and were more likely to underestimate their performance than control participants in a video-taped conversation with an experimental assistant.

In addition socially anxious individuals are more likely to assume that negative social outcomes will occur than positive outcomes or negative non-social outcomes (Ledley & Heimberg, 2006). Foa and colleagues (1996) compared 15 patients with social anxiety disorder to non-anxious controls and found that the socially anxious group were more likely to rate negative social events, such as freezing during a job interview, as likely to occur. In addition socially anxious participants rated the cost of these events more highly than non anxious controls on a 9 point likert scale between 0 *not at all bad* and 8 *extremely bad*.

These studies indicate that the information processing style of socially anxious individuals may be influenced by negative assumptions about themselves and their social world and suggest that strategies which support socially anxious individuals to manage negative assumptions may lead to a reduction in the distress associated with social anxiety.

Shift to Self Focussed Attention

A number of studies have provided evidence that people who experience social anxiety engage in greater levels of self-focussed attention when anxious than others. In a study of 58 socially anxious and 58 non-anxious participants Mellings and Alden (2000) found that socially anxious participants reported significantly more self-focussed attention during a social interaction than non-anxious controls. Social anxiety has been found to correlate with public self-consciousness, defined as attention to those aspects of the self that may be noticed by others (Fenigstein, Scheier, & Buss, 1975). Individuals with social anxiety have been found to score higher on a measure of public self-consciousness than those with other forms of anxiety (Saboonchi, Lundh, & Ost, 1999)

Increased Attention to Anxiety Symptoms

For socially anxious individuals, high levels of self-focussed attention may increase awareness of anxiety symptoms (e.g., blushing, trembling, sweating). Research suggests that this information is used by individuals in establishing how they were perceived by others in a social situation. Wells and Papageorgiou (2001) found that socially anxious participants reported higher anxiety levels when presented with false information that their pulse rates were increasing during a social interaction. This study did not include a measure of heart rate however so it is not clear whether false information about pulse rate may have led to increases in actual heart rate and generated greater anxiety. Similarly, Mansell and Clark (1999) asked high and low socially anxious participants to present a speech and afterwards rate the extent to which they were aware of their anxiety symptoms. Among the high social anxiety group a significant positive correlation was found between awareness of anxiety symptoms and overestimations of negative aspects of their performance. Mauss, Wilhelm and

Gross (2004) found that participants high in social anxiety perceived more anxiety symptoms whilst experiencing social threat than those low in social anxiety, even though there were no differences between groups on objective measures.

Decreased Attention to External Cues

A further consequence of increased self-focussed attention is reduced attention to external social cues (Clark, 2001). This is supported by evidence that individuals high in social anxiety have more difficulty than those low in social anxiety recalling information following a social interaction (Hope, Heimberg, & Klein, 1990). In a study by Bond and Omar (1990) participants high in social anxiety reported significantly greater memory loss whilst waiting to give a speech than those low in social anxiety. Similar results were reported by Daly, Vangelisti and Lawrence (1989), who found that participants high in public speaking anxiety recalled more self-referent cognitions during a speech performance and performed poorer on measures of memory than low-anxious controls. High levels of self-focussed attention may mean that the socially anxious individuals do not attend to aspects of a social interaction and therefore this information is not encoded, leading to difficulties recalling it later (Roth Ledley & Heimberg, 2006).

Overall these studies suggest that high levels of self-focussed attention in social anxiety result in both over and under-engagement of attention to the self and the social world respectively. This under and over-engagement is associated with multiple costs to the individual and suggest that strategies to reduce self-focussed attention may lead to reduced distress.

Changes to Information Processing

Assumptions about the self and the social world, in conjunction with high levels of self-focussed attention, may lead to changes in the way socially relevant information is processed. Studies suggest that socially anxious individuals attend to, remember and interpret social information in a way that is biased towards evidence of criticism or failure (Ledley &

Heimberg, 2006). In addition socially anxious individuals are more likely to engage in rumination about possible failure before and after a social event than those without anxiety.

Attention Bias

The limited processing of the external social situation that does occur appears to be negatively biased (Clark, 2001). Socially anxious individuals are more likely to notice evidence that they believe indicates social failure or disapproval from others, although this evidence may actually be ambiguous (Amin, Foa, & Coles, 1998).

Socially anxious individuals are very sensitive to signs of social danger in their environment (Roth, 2004). This is supported by studies demonstrating that socially anxious individuals are hypervigilant for social threat. An attentional bias toward threat is suggested in a study by Veljaca and Rapee (1998) examining attention to positive and negative audience feedback. They found that participants high in social anxiety were more likely to notice evidence of negative feedback such as yawning from audience members while they presented a speech. Conversely, participants low in social anxiety demonstrated the opposite effect, and were more likely to notice positive audience behaviours such as leaning forwards.

Hypervigilance has also been explored via a 'face-in-the-crowd' experimental paradigm in which participants are shown a number of faces and asked whether any had a different facial expression from the others. Although both anxious and non-anxious participants notice an angry face among the crowd more readily than happy or neutral faces, Gilboa-Shectman, Foa and Amir (1999) found that this effect was more pronounced in individuals with social anxiety disorder than non-anxious controls.

Additional evidence of hypervigilance for social threat is demonstrated in studies using an emotional Stroop paradigm (Hope, Rapee, Heimberg, & Dombeck, 1990; Mattia, Heimberg,

& Hope, 1993). In this paradigm participants are asked to name the colour of social threat words (e.g., inadequate, criticised), physical threat words (e.g., fatal, illness) and control words matched for their length and frequency of occurrence in the English language (e.g., insert, obsidian). Participants with social anxiety disorder demonstrate a significantly greater latency on social threat words than those with other anxiety disorders, suggesting that these words may hold their attention and slow performance (Lundh & Ost, 1996; Maidenberg, Chen, Craske, Bohn, & et al., 1996; Mattia et al., 1993). The adapted Stroop task has demonstrated consistently that both clinical and non-clinical anxious populations tend to demonstrate longer latencies when naming threat words than non-anxious controls (Mobini & Grant, 2007). The same effect is not demonstrated for control words or words that are physically threatening and is therefore thought to demonstrate preferential allocation of attention to social threat stimuli (Mobini & Grant, 2007). Mattia and colleagues (1993) found that socially anxious respondents who had responded to CBT or pharmacological treatment demonstrated reduced latencies for socially threatening (but not neutral or physically threatening) words compared to those who had not responded to treatment.

In addition to Stroop studies, researchers have investigated attentional bias in social anxiety using a dot probe paradigm (Roth Ledley & Heimberg, 2006). This paradigm involves showing participants two stimuli (e.g., words or faces) on a screen followed by a dot in place of the stimuli. Participants who respond more quickly when the dot is in the position of emotionally valenced rather than neutral stimuli are thought to indicate an attentional bias towards this stimulus. This effect was demonstrated in a study by Asmundson and Stein (1994) who found that participants with social anxiety disorder responded significantly faster when the dot appeared in the same position as a social threat word (e.g., foolish) than a neutral word or a physical threat word (e.g., dizzy). The authors concluded that this finding provided further support for an attentional bias towards social threat among this group. Mansell, Ehlers, Clark and Chen (2002) were not able to replicate this finding in a non-clinical sample of socially anxious university students and concluded that social anxiety may not be associated with selective attention with for threat words. This study used a non-clinical population classified as high in social anxiety on the basis of a score of 17 or higher on the Fear of Negative Evaluation (FNE) survey. Other studies, including the present research,

have used FNE scores greater than 20 to classify participants as high in social anxiety (Han-Joo & Telch, 2008; Spurr & Stopa, 2003; Vassilopoulos, 2005). The absence of an effect in Mansell and colleagues study may reflect lower ratings of social anxiety and indicate that hyper-vigilance to threat is associated with higher levels of social anxiety.

Other studies using the dot-probe paradigm have presented faces instead of words to explore attentional bias. Chen, Ehlers Clark and Mansell (2002) presented negative, neutral and positive faces as well as household objects to 20 socially phobic patients. In contrast to studies using word stimuli they found that response times were significantly slower when dots were presented in the location of a face than neutral stimuli such as a household object. It is not clear why responses to face and word stimuli differ but it has been suggested that slower reaction times to faces in the context of social-evaluative threat may reflect a vigilance-avoidance pattern of responding (1987; Roth Ledley & Heimberg, 2006). This pattern of responding may occur because threat detection generates anxiety and motivates the individual to avoid the threat by directing attention away from its source (Mogg et al., 1987).

Mansell and colleagues (1999) investigated responses to the dot probe task using face stimuli in a non-clinical sample of high and low socially anxious participants. Participants low in social anxiety did not demonstrate an attentional bias away from faces. Participants high in social anxiety only demonstrated this bias after being told they would have to give a speech. This suggests that a vigilance-avoidance attentional style may not be apparent in non-clinical populations without the threat of social evaluation.

Roth Ledley and Heimberg (2006) suggest that avoidance of faces might maintain social anxiety in several ways. For example, the socially anxious individual might come across as disinterested if they avoid eye contact, making others less likely to interact with them and therefore reducing opportunities for positive social interaction. In addition they may miss out on information conveyed by facial expressions during conversation that could help it go well. Reduced observation of faces may also make it difficult to remember people previously met.

These factors could increase the chances of negative social interactions and perpetuate negative beliefs about the self and the social world.

Overall these studies provide evidence of an attentional bias towards social threat among this group, countered by a vigilance-avoidance pattern for faces. This suggests that social anxiety is associated with both over and under-engagement of attention to socially relevant stimuli. A tendency to over-engage with negative stimuli may perpetuate negative beliefs about the self and the social world, and may also influence memory formation and interpretations of social events. Under-engagement of attention in the form of avoidance may also be associated with cognitive, behavioural and interpersonal consequences that maintain social anxiety and associated distress. It is not clear from these studies if this attentional style is an inherent quality of the individual, however, research suggesting it may be altered with attention training (Schmidt, Richey, Buckner, & Timpano, 2009) suggests this is unlikely.

Memory Bias

Memory bias also plays a role in social anxiety since bias towards recalling negative aspects of a social interaction might reinforce negative beliefs about the self and the social world, therefore maintaining social anxiety and related distress. Studies of memory bias in social anxiety have generated mixed results. Although Amir, Foa and Coles (2000) found that socially anxious individuals had better implicit memory for socially threatening sentences masked with white noise, other studies have failed to demonstrate any evidence of memory bias (Lundh & Ost, 1997; Ronald M. Rapee, McCallum, Melville, Ravenscroft, & et al., 1994).

Studies investigating memory for social interactions have also generated mixed results. O'Banion and Arkowitz (1977) found that women high in social anxiety had better memory for negative, but not positive feedback received about themselves, than those low in social anxiety. Bias in memory may relate to biases in attention. If attention is biased toward social

threat then memory bias might arise simply because information about social threat is encoded more readily (Roth Ledley & Heimberg, 2006). In support of this is research demonstrating that individuals with social anxiety disorder are better than control participants at recognising critical faces (Coles & Heimberg, 2005) and recalling those with negative facial expressions (Foa, Gilboa-Schechtman, Amir, & Freshman, 2000), although the relationship of these findings to those demonstrating vigilant-avoidant attention to faces is less clear.

Wenzel and Holt (2002) did not find any evidence of memory bias when they presented socially phobic participants with passages of prose that were either neutral or socially evaluative. Roth Ledley and Heimberg (2006) suggest that this may be because the passages were not directly related to the individual in the way the feedback in O'Banion and Arkowitz's (1977) study was. Inconsistencies in memory findings may reflect patterns of over and under-engagement of attention. A vigilance-avoidance pattern of attending to threat cues and reduced attention to external cues in the context of self-focussed attention, may reduce opportunities to encode information about social stimuli. If so, this suggests that strategies to regulate the allocation of attentional resources may improve socially anxious individuals' capacity to encode and later recall socially relevant information accurately. Accurate recollection of this information may counter negative beliefs about the self and the social world and interrupt cognitive processes that might otherwise maintain social anxiety.

Anticipatory Processing

In addition to changes in information processing during a social event, socially anxious individuals appear to engage in negatively biased information processing prior to a social event which increases anxiety and avoidance of social interactions, and therefore maintains social anxiety (Clark, 2001). Hinrichsen and Clark (2003) investigated the processing style of high and low socially anxious individuals via a semi-structured interview. They found that those high in social anxiety were more likely to report engaging in negatively biased anticipatory processing prior to an event (e.g., recalling past perceived failures, engaging in

negative and catastrophic thinking). In a second study the authors investigated the effect of anticipatory processing (e.g., recalling instances of past social failure, imagining the worst thing that could happen) on socially anxious participants anxiety prior to and during a speech task. Participants who successfully engaged in a distraction task while waiting to speak reported less anxiety prior to and during the speech than those who were prompted to engage in anticipatory processing. Participants who did not engage in the distraction task and spent more than 50% of their time in this task anticipating the speech did not demonstrate this pattern and reported comparable levels of peak anxiety during the speech to those in the anticipation condition.

A similar study by Vassilopoulos (2005) provides further evidence that anticipatory processing may maintain social anxiety. When asked to engage in anticipatory processing or distraction no differences were observed between conditions for participants low in social anxiety. However high anxious individuals in the anticipatory processing condition felt more anxious and predicted more negative outcomes than the distraction group or controls. Interestingly, high socially anxious individuals in the distraction group recalled more negative and less positive information about their presentation than those in the anticipation group. Vassilopoulos suggests that thought suppression in the distraction condition might have enhanced recall of negative words. An association between social anxiety and problematic thought suppression has previously been identified (Fehm & Margraf, 2002).

Once again these studies suggest that social anxiety is associated with tendencies to over-engage attention with cognitive content (anticipatory worry) that may maintain social anxiety. In addition they suggest that there may also be a link between under-engagement with cognitive content (thought suppression) and the maintenance of social anxiety. These studies provide further indication that strategies to promote objective and balanced engagement with cognition may reduce distress associated with social anxiety.

Post-Event Processing

Socially anxious individuals also appear to engage in more negatively biased information processing after a social event than others (Clark, 2001). Mellings and Alden (2000) investigated post event processing in socially anxious and non-anxious undergraduate students. Socially anxious participants engaged in significantly more rumination after a social event than controls and this contributed to their recall of negative self-related information. The authors suggest that this processing style may maintain social anxiety by reinforcing negative representations of the social self.

Abbot and Rapee (2004) compared post-event rumination in individuals with social anxiety disorder and non-anxious controls in the week following an impromptu speech task. Individuals with social phobia engaged in significantly more negative rumination than controls in the week following the speech and rated their speech significantly more poorly. During this time control participants shifted to significantly more positive ratings of their own performance than the socially phobic group. Again these studies suggest that over-engagement with cognitive content (thoughts of past social failure) may maintain social anxiety.

Judgement and Interpretation Bias

Research indicates that socially anxious individuals are more likely to interpret ambiguous social situations negatively than non-anxious individuals or individuals with other anxiety disorders (Amin et al., 1998). Constans, Penn, Ihen and Hope (1999) presented 47 high and 47 low socially anxious university students with a vignette about a blind date which included ambiguous information about social and non-social aspects of the date. Participants in the high social anxiety group were more likely to interpret social aspects negatively but not more likely to interpret non-social aspects this way. This suggests that an interpretation bias applies specifically to processing of socially relevant information. Negative interpretations of social information might reinforce negative beliefs and maintain social anxiety. Strategies that

support objective processing and interpretation of social interaction could therefore be useful in reducing social anxiety.

Summary

Studies of cognitive processing in social anxiety suggest that negative assumptions about the self and the social world are central to social anxiety, and these are maintained by a number of distortions in information processing (Clark, 2001; Roth Ledley & Heimberg, 2006). Socially anxious individuals are critical of their social behaviour and monitor this closely. High levels of self-focussed attention result in over-engagement with anxiety symptoms, which are interpreted as evidence of social failure (Mauss et al., 2004). In addition under-engagement of attention to social interactions perpetuates difficulties with these (Roth Ledley & Heimberg, 2006). Socially anxious individuals evaluate social threat in the context of over or under-engaged attention with threat cues (Hope, Rapee et al., 1990; Mansell et al., 1999; Mansell et al., 2002). This attentional bias may maintain anxiety by perpetuating problems with social interaction and reinforcing negative assumptions about the self and the social world. Problems with over and under-engagement of attention are also apparent from studies of memory bias (Amir et al., 2000), anticipatory processing (Hinrichsen & Clark, 2003; Vassilopoulos, 2005) and post-event processing (Abbott & Rapee, 2004; Mellings & Alden, 2000) of social interactions. To summarise, tendencies to over and under-engage attention maintain social anxiety in conjunction with a bias towards interpreting social experiences negatively and a critical perspective of one's social behaviour. The ongoing experience of social anxiety that results from this is characterised by both anxious emotions and behavioural avoidance. This model suggests that strategies that promote; balanced attention to experience, objective information processing, improved emotional and behavioural regulation and reduced self-criticism, may reduce distress related to social anxiety.

Cognitive and Behavioural Treatments

Treatments for social anxiety disorder aim to reduce distress associated with the anxiety and increase the individual's level of social functioning (Andrews et al., 2003). Cognitive and

behavioural strategies aim to equip the socially anxious individual with strategies to function better and with less distress in social settings (Heimberg, 2002b). Cognitive and behavioural treatment approaches to social anxiety are described in the following sections. These approaches include; social skills training, relaxation, exposure, and combined cognitive-behavioural therapy approaches.

Social Skills Training

Early conceptualizations of social anxiety disorder suggested that problems with functioning in social situations arise from a lack interpersonal skill (Heimberg, 1989). While this view is no longer popular, research does suggest that socially anxious individuals often perceive their social behaviour as inadequate (Stopa & Clark, 1993). Social skills training incorporates modelling, behavioural rehearsal, corrective feedback and social reinforcement in an attempt to teach effective social behaviour. While there is some evidence that this treatment approach may be effective (Turner, Beidel, Cooley, & Woody, 1994) benefits may actually arise from exposure to feared stimuli, since training is conducted in group settings and includes homework exercises which require the individual to participate in social activities (Heimberg, 1989).

Relaxation Strategies

Historically a small number of studies have also looked at the effectiveness of applied relaxation procedures in the treatment of social phobia (Heimberg, 1989). Applied relaxation strategies incorporate relaxation skills with role played social interaction and in vivo homework exercises. While there is some evidence that these approaches may be effective (Jerremalm, Jansson, & Ost, 1986; Ost, Jerremalm, & Johansson, 1981), it is again unclear whether exposure to social interaction may contribute observed effects.

Exposure

Research indicates that graded exposure in group settings and in real life situations reduces avoidance of social situations and physiological symptoms associated with anxiety (Wlazlo, Schroeder-Hartwig, Hand, Kaiser, & et al., 1990). Although exposure has been shown to reduce physiological symptoms of anxiety, it may be less effective than cognitive approaches in changing irrational beliefs (Emmelkamp, Mersch, Vissia, & Van der Helm, 1985). There is also some evidence that improvements resulting from exposure therapy begin to deteriorate three months after treatment (Mattick & Peters, 1988).

Cognitive Behavioural Treatments

CBT combines cognitive strategies, such as cognitive restructuring, which addresses the negative cognitions about the self and the social world thought to maintain social anxiety, with behavioural techniques, such as exposure to reduce social avoidance. Cognitive Behavioural Group Therapy (CBGT) is a group-based cognitive behavioural approach which combines simulated exposure exercises and cognitive restructuring as part of a 12-week intervention. Clients usually attend in groups of six for 2.5 hours per session (Heimberg, 2002a). The efficacy of CBGT has been demonstrated in comparison to a wait list control group (Hope et al., 1995) and a psychological intervention placebo group (Heimberg et al., 1990). A follow up study has also demonstrated maintenance of therapeutic gains up to 6 years after the cessation of treatment (Heimberg, Salzman, Holt, & Blendell, 1993)

Although the efficacy of cognitive behavioural (CBT) approaches has been demonstrated concerns about the limitations of CBT-based interventions have been expressed (Hayes, Follette & Linehan, 2004). Effect sizes reported in CBT outcome studies appear to have stagnated and are not increasing so that a percentage of those with social anxiety consistently fail to respond to treatment with CBT (Herbert, Rheingold, Gaudiano, & Myers, 2004). Hofmann and Bogels (2006) have estimated that 40 – 50% of socially anxious clients treated with CBT show little improvement. As a result there is interest in devising new strategies to assist those who do not currently benefit from treatment.

Component analyses of CBT indicate that the cognitive restructuring component of this approach may not enhance treatment outcomes (Ilardi & Craighead, 1994). Gains may arise simply from teaching clients to be aware of their thoughts and feelings and helping clients to change the content of their thoughts may add no further benefit. In a meta-analysis of CBT for social anxiety Gould, Buckminster, Pollack, Otto and Yap (1997) found that exposure treatments yielded the biggest effect sizes regardless of whether they were carried out on their own ($d = .89$) or in conjunction with cognitive restructuring ($d = .80$). Similarly Feske and Chambless (1995) conducted a meta-analysis and found no difference in effectiveness when patients were treated with exposure alone or CBT. Hope, Heimberg and Bruch (1995) compared standard CBGT to an exposure only intervention and found that the exposure intervention was as effective as CBGT. It may be that clients in exposure only interventions spontaneously engage in their own cognitive restructuring (Rodebaugh, Holaway, & Heimberg, 2004)

A further criticism of CBT is that, since it focuses heavily on cognitive content, it may ignore features of the individual's processing style that contribute to anxiety. Distorted attentional processing is believed to contribute to the maintenance of social anxiety and therefore approaches that address this have been trialled. Clark and colleagues (2003) investigated the effectiveness of a modified version of CBT that addressed aspects of attentional style described in Clark and Wells model (e.g., training in redirecting attention from self focus to the social situation, awareness of problematic aspects of anticipatory and post-event processing). They found that this approach was superior to treatment with an antidepressant medication and self-exposure. Similarly, Wells, White and Carter (1997) found that attention training reduced anxiety and negative beliefs for a patient with social phobia, and Wells and Papageoriou (1998) found that the effectiveness of exposure interventions was enhanced by training socially anxious participants to redirect internally focussed attention externally. Recently Schmidt, Richey, Buckner and Timpano (2009) found participants who completed attention training to disengage from socially threatening faces on a dot probe task had significantly reduced social anxiety on completion compared to controls.

These studies suggest that although CBT treatments of social anxiety may be enhanced by training individuals to manage their attention, the provision of cognitive restructuring techniques may not improve treatment outcomes. Excluding a cognitive restructuring component would enable treatment approaches to be presented more briefly, and therefore to be more cost effective. In addition group-based approaches that excluded cognitive restructuring may be more acceptable to clients who would not need to disclose negative cognitions in front of others. This may be particularly relevant for this population given their exaggerated concerns about self-presentation (Clark & Wells, 1995). Treatment approaches that emphasise attentional processing instead of cognitive restructuring could not only be relatively brief and cost effective they could also be presented in a way that was more affirming to clients, placing emphasis on the acquisition of new attentional skills rather than remediating faulty cognitions. In addition attention training could be provided by non-clinicians in non-clinical settings. Research indicates that socially anxious individuals tend to underuse mental health services (Magee, Eaton, Wittchen, McGonagle, & Kessler, 1996) because of stigma associated with mental illness and beliefs that their problems are related to their personality (Wagner, Silove, Marnane, & Rouen, 2006). Training provided in a non-clinical environment might be accessed more readily by those reluctant to access mental health support. For these reasons a mindfulness-based approach, which excludes cognitive restructuring and instead changes attentional processing may offer a valuable alternative to CBT treatment approaches to social anxiety.

CHAPTER 3

MINDFULNESS

Overview

The concept of mindfulness originates from Buddhist philosophy and is closely linked to meditative practices which emphasize the development of awareness in the present moment (Goldstein, 2002; Gunaratana, 2009; Kapleau, 1965). Both Buddhist philosophy and western psychology purport that the development of mindfulness is associated with psychological wellbeing (Goldstein, 2002; Kabat-Zinn, 1994). There has been a rapid rise in interest in mindfulness as a psychological intervention in the last two decades and mindfulness-based practices have been secularized and adapted into treatment approaches (Kabat-Zinn, 1994; Linehan, 1993a; Segal, Williams, & Teasdale, 2002).

This chapter provides a definition of mindfulness and describes the main mindfulness-based therapy approaches in current clinical practice; Mindfulness-Based Stress Reduction, Mindfulness-Based Cognitive Therapy, Dialectical Behaviour Therapy and Acceptance and Commitment Therapy. While participation in these treatment approaches has been associated with positive outcomes for a range of populations these approaches are intensive and multifaceted. As a result outcome studies of these approaches do not necessarily illustrate which of the effects observed are attributable specifically to mindfulness training. Research suggests that mindfulness may generate positive outcomes through a variety of mechanisms including changes to attentional processing, promotion of a decentered objective view of internal events, enhancing emotional and behavioural regulation and increasing self-compassion. Literature supporting these mechanisms is reviewed.

Definitions of Mindfulness

Mindfulness describes a process in which a particular type of attention is brought to moment-by-moment awareness. It includes an awareness of all events in the present moment that occur inside and outside the individual (Brown & Ryan, 2004). Internal events may

include both bodily sensations (e.g. heart rate, respiration) and mental events (e.g., thoughts and feelings). External events include everything in the outside world (e.g. the physical environment, other people, and things experienced through the five senses). Mindful awareness is non-elaborative and non-judgmental so that experiences are observed as they arise but are not judged or over-engaged with.

During mindfulness training the individual practices attending to one particular focus (e.g., sensations of the breath) whilst accepting that the mind will typically wander to other experiences that enter the field of awareness (e.g., body sensations of discomfort, memories, and thoughts). When attention is lost the individual is encouraged to take note of where the mind has wandered to before gently redirecting attention back to the object of focus. In this way mindfulness incorporates both focussed attention and broader awareness of the field of experience (Brown & Ryan, 2003). All experiences that enter awareness are to be accepted without judgement. This accepting stance is a key feature of mindfulness and participants are discouraged from judging their experience as either good or bad in anyway.

Mindfulness has been defined in various ways by different authors. Brown and Ryan (2003, p. 822) define mindfulness purely in terms of awareness as, “the state of being attentive to and aware of what is taking place in the present moment”. Other definitions have emphasised particular qualities of attention. For example Kabat-Zinn (1994, p. 4) defines mindfulness as “paying attention in a particular way; on purpose, in the present moment and non-judgementally”. Bishop and colleagues (2004) have attempted to define mindfulness in operational terms for the purposes of research. They propose a two-component model of mindfulness in which the first component is the self-regulation of attention and the second component is the accepting stance taken to current experience.

Current conceptualisations of mindfulness suggest that it may be both a dispositional trait (Brown & Ryan, 2003; Kabat Zinn, 1994) and a skill or state that can be learned and applied in a more sporadic manner (Kabat-Zinn, 1994). Higher levels of trait mindfulness have been

associated with enhanced affect regulation (Creswell, Way, Eisenberger, & Lieberman, 2007) and lower daily levels of negative affect (Brown & Ryan).

Trait mindfulness has also been investigated in relation to anxiety sensitivity and anxious arousal (Vujanovic, Zvolensky, Bernstein, Feldner, & McLeish, 2007). Anxiety sensitivity refers to the extent to which an individual fears anxiety and related symptoms. Higher levels of anxiety sensitivity have been associated with greater physiological symptoms of anxiety (anxious arousal) and panic attacks (Schmidt, Lerew, & Jackson, 1997; Vujanovic et al., 2007). Vujanovic and colleagues found that trait mindfulness moderated the relationship between anxiety sensitivity and anxious arousal in a community sample. Specifically respondents who were high in both anxiety sensitivity and mindfulness experienced lower levels of anxious arousal than those who were high in anxiety sensitivity but low in mindfulness. Arch and Craske (2010) compared the influence of trait mindfulness on responses to stressors in clinically anxious and non-anxious controls. They found that higher levels of trait mindfulness were associated with less distress in response to laboratory stressors in both the anxious and non-anxious groups. These studies suggest that trait mindfulness may be associated with an enhanced ability to manage feelings of anxiety.

Although trait mindfulness is construed as a relatively stable ability, it is believed that it can be increased via mindfulness training and practice of mindfulness techniques (Brown & Ryan, 2003; Michalak, Heidenreich, Meibert, & Schulte, 2008; Segal et al., 2002).

Researchers have attempted to induce state mindfulness in undergraduate populations with no prior mindfulness experience by presenting mindful breathing within a laboratory setting (e.g., Arch & Craske, 2006; Broderick, 2005; Feldman, Greeson, & Senville, 2010). Arch and Craske compared the effects of a 15 minute focussed breathing task, adapted from Kabat-Zinn's (1994) mindfulness of the breath instructions, to unfocussed attention or worry. Participants in the focussed breathing condition demonstrated greater willingness to view affectively valenced slides than participants in the other conditions. The authors suggested that this willingness might have reflected improved emotion regulation based on tolerance to the disturbing stimuli (Arch & Craske, 2006). Similarly, Broderick (2005) found that

participants who completed an 8 minute mindfulness of breathing meditation task experienced lower levels of negative mood following a dysphoric mood induction relative to participants who engaged in rumination or distraction. Recently, Feldman and colleagues (2010) compared a 15 minute mindful breathing exercise with progressive muscle relaxation and loving kindness meditation for novice meditators (undergraduate students) and found that the mindful breathing group reported greater objectivity towards thoughts than participants in the other two groups. These studies suggest that even brief introductions to mindfulness may result in positive outcomes. It is not clear from these studies however whether any of the beneficial effects observed endured beyond the experimental session.

Mindfulness Based Interventions and Their Efficacy

Currently mindfulness is incorporated as a component of several psychological therapies. These interventions have been described as ‘third wave’ therapies that differ from purely behavioural or cognitive behavioural therapies in that they emphasize mindfulness and acceptance (Hayes, Follette & Linehan, 2004) either through formal practice of mindfulness techniques (eg., meditation; Kabat-Zinn, 1994), or as a philosophical approach to reducing suffering (Linehan, 1993b). These therapies include approaches intended to reduce distress in a wide range of populations (e.g., Mindfulness Based Stress Reduction, Kabat-Zinn, 1994 and Acceptance and Commitment Therapy; Hayes, Strosahl & Wilson, 1999) as well as those intended for specific groups (e.g., Mindfulness Based Cognitive Therapy, Segal et al., 2002; Dialectical Behavior Therapy). Outcome data from studies of these therapies provide information on the effectiveness of mindfulness as a treatment intervention.

Mindfulness Based Stress Reduction

Mindfulness Based Stress Reduction (MBSR) is one of the earliest mindfulness-based approaches to be implemented (Kabat-Zinn, 1994) and one of the most widely applied and researched (Grossman, Niemann, Schmidt, & Walach, 2004). Although originally designed for use with chronic pain and stress related disorders its efficacy has now been demonstrated more recently among diverse populations including those who experience anxiety and

depression (Grossman et al., 2004; Ramel, Goldin, Carmona, & McQuaid, 2004). MBSR is an 8 week group-based mindfulness training course (Kabat-Zinn, 1994). Participants usually attend in groups of up to 30 individuals. Training is held weekly for 2 to 2.5 hours and participants are taught and practice mindfulness skills including body scanning (in which they learn to attend sequentially to body sensations without reacting), seated meditation (in which participants attend to the breath), and hatha yoga (in which participants attend to the posture and movement of the body). Mindfulness of daily activities such as walking and eating are also included. Participants are encouraged to practice daily at home, and audio CDs are provided to support this.

Participation in the MBSR program has been found to reduce ruminative thinking (Ramel et al., 2004; Shapiro, Brown, & Biegel, 2007), and to reduce stress symptoms for cancer patients (Speca, Carlson, Goodey, & Angen, 2000). For woman with breast cancer participation in MBSR has also been found to improve sleep quality (Shapiro, Bootzin, Figueredo, Lopez, & Schwartz, 2003). Participation in the MBSR program has been found to reduce pain and psychological distress in sufferers of chronic pain and fibromyalgia and to increase pain acceptance and physical functioning (Grossman, Tiefenthaler-Gilmer, Raysz, & Kesper, 2007; Morone, Greco, & Weiner, 2008; Plews-Ogan, Owens, Goodman, Wolfe, & Schorling, 2005). When compared to CBT, MBSR has been found to be a more efficacious treatment for sufferers of rheumatoid arthritis who also experience recurrent depression (Zautra et al., 2008). Results of a recent meta-analysis indicate that MBSR also significantly reduces stress levels in healthy subjects (Chiesa & Serretti, 2009).

These studies suggest that MBSR participation is associated with positive outcomes for a wide range of populations. Recent studies have also investigated outcomes for socially anxious participants in MBSR programs. These suggest that MBSR may lead to improvements in mood, functioning, and quality of life for socially anxious individuals (Koszycki, Benger, Shlik, & Bradwejn, 2007) and to increase positive self-views and reduce emotional responses to negative self-views through application of mindful breathing

techniques (Goldin & Gross, 2010; Goldin, Ramel, & Gross, 2009). These findings support the application of a brief mindfulness-based approach to managing social anxiety.

Mindfulness Based Cognitive Therapy

Mindfulness Based Cognitive Therapy (MBCT) was adapted from MBSR but differs in that it also includes elements of cognitive therapy to facilitate a detached approach to cognitions. MBCT is an 8 week group-based intervention which has been manualised for use with sufferers of recurrent depression (Segal et al., 2002). Teasdale, Segal and Williams (1995) based their use of mindfulness with this population on an information processing theory of depression, which proposes that individuals who experience recurrent depression are vulnerable to further recurrence whenever they experience a mild dysphoric mood, as this mood triggers past patterns of depressive thinking. MBCT incorporates mindfulness practices from MBSR. By teaching participants to observe thoughts and feelings non-judgementally MBCT encourages participants to adopt a decentred approach to their experience in which thoughts are viewed as passing mental events distinct from the self and not necessarily accurately reflecting reality. In doing so it is thought that depression related cognitions are less likely to spiral into patterns of ruminative thinking that might lead to a recurrence of depression (Teasdale et al., 1995)

MBCT has been found to significantly reduce the risk of relapse for depressive patients who have experienced three or more episodes of depression, but not to reduce the risk in patients who have experienced less depressive episodes than this (Barnhofer et al., 2009; Ma & Teasdale, 2004; Teasdale et al., 2000). It may also reduce anxiety for bipolar patients in remission (Williams et al., 2008), improve worry, stress and quality of life for those who experience generalized anxiety disorder (Craigie, Rees, Marsh, & Nathan, 2008) and reduce binge-eating behaviour in eating disordered groups (Baer, 2005). The efficacy of MBCT as an intervention approach to ruminative thinking provides further support for the application of a mindfulness-based approach to social anxiety, in which over-engagement with social anxious cognitions may maintain the disorder.

Dialectical Behaviour Therapy

Dialectical Behaviour Therapy (DBT) is a therapy approach created to treat borderline personality disorder (Linehan, 1993a, 1993b). DBT combines skills-based group training and individual therapy. Unlike MBSR and MBCT mindfulness training is not the primary focus of DBT. Instead training in mindfulness skills is conducted as a component of a multifaceted approach that also includes modules on interpersonal effectiveness, distress tolerance and emotion regulation. Although presented as a unique module, mindfulness skills are deemed relevant to the application of other modules. For example, remaining mindful during a difficult interaction is a component of interpersonal effectiveness. Mindfulness concepts are presented to clients as ‘what’ skills (i.e., what to do; observe, describe and participate) and how skills (i.e., how to do it; non-judgementally, one-mindfully, effectively). The overarching philosophy of DBT is a dialectical world view within which reality consists of opposing forces. Central to these forces is a dialectic of acceptance and change so that clients are encouraged to accept things as they are now, whilst endeavouring to make change in their lives. Mindfulness skills are thought to support the synthesis of these concepts. DBT is an efficacious treatment approach for borderline personality disorder, depression in older adults and individuals with eating disorders (Lynch, Trost, Salsman, & Linehan, 2007).

Acceptance and Commitment Therapy

Acceptance and Commitment Therapy (ACT) is a therapy approach designed for application to a wide range of difficulties. Although it is not based philosophically on mindfulness it shares similarities in that it aims to reduce distress by supporting clients to develop an understanding that thoughts and emotions may not reflect reality (described as cognitive defusion). Mindfulness exercises are used to support a client’s ability to observe and experience mental events without judgment or attempts to control them. In this way acceptance of current experience is fostered (Hayes, Luoma, Bond, Masuda & Lillis, 2006). The efficacy of ACT’s cognitive defusion and acceptance components has been demonstrated in component studies across a variety of contexts including; reductions to believability and distress associated with negative self-referential thoughts, and enhanced ability to tolerate

physical discomfort in CO₂ enriched environments, designed to induce sensations similar to anxiety (Hayes et al., 2006).

Summary

The effectiveness of these therapy approaches suggests that mindfulness-based therapies can generate positive effects in wide range of populations and may similarly generate positive outcomes in the treatment of social anxiety. However, each of these therapy approaches is intensive and multifaceted and outcome data do not necessarily illustrate the nature of the relationship between mindfulness training and the changes observed.

Proposed Mechanisms of Mindfulness

While the efficacy of mindfulness-based approaches has been demonstrated, the exact mechanisms by which these approaches bring about change are unclear. In their review of the neurobiological and clinical features of mindfulness meditation Chiesa and Serretti (2010) note that although a number of studies have demonstrated beneficial effects for participation in mindfulness-oriented programs, problems with the design of these studies mean it is not always clear whether the effects demonstrated are due to specific or non-specific effects of mindfulness training. Where studies fail to use a comparison sample it is unclear whether the effects observed arise specifically from training in mindfulness, or from some other aspect of the intervention. An understanding of such change mechanisms provides essential information about the utility of a therapeutic approach (Doss, 2004). A number of potential mindfulness mechanisms have been identified including; changes to attentional processing, decentering, emotional and behavioural regulation, and self-compassion. Evidence supporting the existence of these mechanisms is presented and reviewed in the following sections.

Changes to Attentional Processing

Since the purpose of mindfulness is to develop non-elaborative awareness of current experience then it would follow that mindfulness training should lead to increased awareness of different aspects of experience (both internal personal aspects and external contextual aspects), and that attention to this should be balanced so that nothing is avoided (under-engagement of attention, e.g., thought suppression) or clung to (over-engagement e.g., rumination). Since over and under- engagement strategies have been associated with increased distress (Hayes & Feldman, 2004; Nolen-Hoeksma, 1991; Wegner & Zanakos, 1994) then enhanced attentional processing may reduce distress.

Research indicates that mindfulness meditation may improve attentional processing (Chiesa & Serretti, 2010). Holzel and colleagues (2007) conducted an fMRI study of long term mindfulness meditators and non-meditators while they participated in mindfulness of the breath and mental arithmetic tasks. They found that meditators demonstrated greater activation of the rostral anterior cingulate cortex, a brain region thought to be involved in 'conflict monitoring'. During mindful breathing the meditator's objective is to attend to the breath. All other information that enters awareness, including external distractions and internal mental events, would be equivalent to conflicting information streams. Activation of this area then might reflect enhanced regulation of attention as managing distraction.

Mindfulness training may improve two distinct forms of attention (Chambers, Lo, & Allen, 2008; Jha, Krompinger, & Baime, 2007), concentrative attention, which arises when attention is focussed on a specific object (e.g., the breath), and receptive attention, which arises from a broader state of awareness as the individual observes the wandering nature of the mind. This broader, receptive attention involves maintaining a ready state of receptiveness to all experience. Some traditional mindfulness texts suggest that practitioners need to develop concentrative attention first so that they have sufficient capacity to maintain receptive awareness and manage potential distracters (Brown, 1977; Kapleau, 1965). Jha and colleagues (2007) found support for this hypothesis in an fMRI study of novice meditators

and experienced meditators. Both experienced meditators and novices completing an 8 week MBSR course demonstrated improved voluntary attention skills, suggesting that practice of concentrative techniques may enhance these abilities. They also found that experienced meditators demonstrated greater skill on tasks requiring attentional readiness than novice meditators or control participants, suggesting that greater experience with concentrative techniques may lead to enhanced receptive attention. These findings support the suggestion that mindfulness training fosters development of an attentional capacity for both focussed and receptive forms of attention. Training in mindfulness should therefore support the individual to maintain conscious control over where attention is directed and increase awareness of broader aspects of experience.

Under-Engagement of Attention

Within the ACT paradigm the tendency to under-engage with aspects of experience as a way of regulating emotion is described as experiential avoidance (Hayes, Wilson, Gifford, Follette & Strosahl, 1996). Experiential avoidance can take many forms including thought suppression, using drugs or alcohol to distance one-self from experiences, and physically avoiding anxiety provoking situations. Experiential avoidance has been associated with a variety of psychological disorders (Hayes et al., 1996). Thought suppression in particular has been associated with an increase in unwanted thoughts (Wegner & Zanakos, 1994) and autonomic reactivity, which may have both psychological and physical health costs (Pennebaker & Susman, 1988). Since mindfulness fosters acceptance of experience, then increased mindfulness should lead to reductions in experiential avoidance and under-engagement strategies (Hayes & Feldman, 2004).

Over-Engagement of Attention

Self-regulation of attention through mindfulness practice enables events to be experienced directly without engagement in ruminative or elaborative thought streams (Bishop et al., 2004; Chambers et al., 2008; Teasdale et al., 1995). Rumination involves recurring thoughts

about one's distress and has been associated with a range of psychological problems including depression and anxiety (Nolen-Hoeksema, 1991; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Mindfulness training has been associated with reduced rumination (Coffey & Hartman, 2008; de Jong-Meyer & Parthe, 2009; Jain et al., 2007; Ramel et al., 2004). Jain and colleagues (2007) conducted a randomized controlled trial comparing the effects of a one month mindfulness meditation course and a one month somatic relaxation course with a control condition. They found significant reductions in post-rumination scores for the mindfulness group as compared to controls. Ramel and colleagues (2004) compared rumination in completers of an MBSR course with a wait-list control group and found that, while rumination scores decreased significantly for course completers, they increased slightly for control participants. Reductions in rumination for mindfulness participants support the notion that mindfulness may reduce over-engagement strategies.

Decentering

In addition to changes in attentional processing mindfulness may also reduce distress through decentering (Baer, 2003; Chambers et al., 2008). Decentering is the process by which internal mental events (e.g., thoughts and feelings) are viewed in a detached way with increased objectivity (Feldman et al., 2010). This may require the ability to attend to internal experience without over or under-engagement. Decentering has been defined elsewhere in the mindfulness literature as 're-perceiving' (Shapiro & Carlson, 2010) and 'defusion', the non-judgemental description of thoughts, feelings, and other private events (Hayes, Luoma, Bond, Masuda, & Lillis). Studies have demonstrated that MBCT and MBSR completers score higher on measures of decentering than control participants (Carmody & Baer, 2008; Carmody, Baer, Lykins, & Olendzki, 2009; Teasdale et al., 2002). Carmody, Baer, Lykins, Oldenski (2009) found that changes to decentering correlated with changes in stress in a sample of 309 MBSR completers. In a recent study by Feldman and colleagues (2010) undergraduate students who participated in a 15 minute mindful breathing exercise were more likely to report perceiving their thoughts from a decentered perspective than those who engaged in either progressive relaxation or a loving kindness meditation. These results

suggest that even brief introductions to mindfulness may be associated with increased objectivity about internal events.

Emotional and Behavioural Regulation

Mindfulness might also reduce distress by enhancing emotion and behaviour regulation skills. Once again these skills may arise from changes to attentional processing and any resultant decentring (Sauer & Baer, 2010). Greater awareness of internal experiences increases the likelihood of responding to these with choice rather than reacting automatically (Segal et al., 2002). This response includes choosing to engage in behaviours and cognitions that enhance behavioural and emotional regulation.

Mindfulness may promote emotion regulation in several ways including; increasing clarity about emotional states, facilitating exposure to emotional states leading to desensitization, increasing options for responding both behaviourally and cognitively, and promoting acceptance of emotional states without over or under-engaging responses. Problems with emotion regulation have been associated with a variety of psychological difficulties including; panic disorder (Marchesi, Fonto, Balista, Cimmino, & Maggini, 2005), borderline personality disorder (Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006), post traumatic stress disorder (Tull, Barrett, McMillan, & Roemer, 2007), and generalized anxiety disorder (Roemer et al., 2009). Conversely adaptive emotion regulation has been associated with higher levels of emotional adjustment (Berking, Orth, Wupperman, Meier, & Caspar, 2008). Participants completing mindfulness-based interventions ranging from 6 to 14 weeks duration have demonstrated post-intervention improvements in emotion regulation (Gratz et al., 2006; Leahey, Crowther, & Irwin, 2008; Tull, Schulzinger, Schmidt, Zvolensky, & Lejuez, 2007). These studies support the suggestion that mindfulness training may enhance emotion regulation skills.

In addition, the conscious objective awareness that arises from decentering may promote behavioural regulation by increasing clarity about values so that behaviour is more likely to align with these, and reducing habitual maladaptive responding (Shapiro & Carlson, 2010). Within the ACT paradigm the term ‘psychological flexibility’ is used to describe an individual’s ability to align behaviour with identified values whilst remaining in contact with the present moment (Ciarrochi, Bilich, & Godsell, 2010). Increasing psychological flexibility is a central aim of ACT. Outcome studies associating reduced mental distress and increased values directed behaviour with participation in ACT are thought to provide support for the benefits of psychological flexibility (Gifford et al., 2004; Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007; Lundgren, Dahl, & Hayes, 2008). Reported outcomes include; higher rates of smoking cessation at 12 months post-intervention than nicotine replacement therapy (Gifford et al., 2004), better management of type two diabetes as compared to an education only intervention (Gregg et al., 2007) and increased weight loss and quality of life for obese persons (Lillis, Hayes, Bunting, & Masuda, 2009). These results suggest that mindfulness training might reduce distress through enhancing emotional processing and the regulation of behaviour.

Self-Compassion

Self-compassion describes a way of relating to the self that is based on caring for, rather than valuing the self, and can therefore be distinguished from self-esteem (Neff, 2003b; Neff, Kirkpatrick, & Rude, 2007; Neff & Vonk, 2009). Self-compassion has been associated with numerous dimensions of psychological health including increased happiness, optimism, and emotional intelligence and decreased thought suppression, rumination and self-judgement (Neff, 2003a; Neff, Rude, & Kirkpatrick, 2007). Participants with higher levels of self-compassion have been found to experience less anxiety following a laboratory stressor in which they were asked to write about their greatest weakness (Neff, Kirkpatrick et al., 2007). This association was not found for self-esteem. Neff (2003a) has defined self-compassion as consisting of three components including; an attitude of self-kindness, seeing flaws and inadequacies as part of the common human experience and accepting painful thoughts and emotions in a balanced (mindful) way, without clinging or avoiding responses. Mindfulness

training has been associated with increases in self-compassion (Moore, 2008; Shapiro, Astin, Bishop, & Cordova, 2005; Shapiro et al., 2007).

The relationship between self-compassion and mindfulness is not clear. Kabat-Zinn (1994) has suggested that an attitude of self-kindness is necessary when practicing mindfulness. Conversely, Brown and Ryan (2003) assert that although self-compassion may be a consequence of becoming mindful it may not be a core component of mindfulness itself. Neff (2003a) suggests that mindfulness is an essential part of self-compassion, allowing thoughts and feelings to be experienced and observed in a balanced way without judgement, avoidance or attachment. The stance of accepting experience adopted in mindful practice may generalise to acceptance of self. If so, this would create a likely basis for self-compassion.

Summary

These studies suggest that positive outcomes associated with mindfulness training may arise from a number of mechanisms including; changes to attentional style so that objects of attention are neither over nor under-engaged with, adoption of an objective decentred perspective of internal experiences, improved capacity to regulate both emotions and behaviours, and increased self-compassion. These mechanisms are associated with positive effects in an array of populations and may also contribute to the management of social anxiety.

CHAPTER 4

MINDFULNESS AND SOCIAL ANXIETY

Although the efficacy of cognitive behavioural therapy has been demonstrated in the treatment of social anxiety disorder (Heimberg et al., 1990; Heimberg et al., 1993; Hope et al., 1995) mindfulness-based interventions may offer a valuable alternative. Changes to attention, decentering, emotional and behavioural regulation, as well as self-compassion could have implications for the array of cognitive processes that maintain social anxiety. Since mindfulness does not include a cognitive restructuring component it could be disseminated by non-clinical instructors in a brief cost-effective format that is applicable to a broad range of consumers. This chapter describes ways in which mechanisms of mindfulness may result in positive outcomes for socially anxious individuals and reviews recent studies of mindfulness based-treatment interventions for individuals with social anxiety disorder.

Changes to Attentional Processing and Social Anxiety

Mindfulness aims to foster awareness of all experience in the present moment including internal mental events and external contextual experiences in the environment. Since social anxiety is associated with increased self-focussed attention then a technique that helps individuals manage their attention and develop an increased awareness of their environment may reduce distress associated with social anxiety. Furthermore, since mindful attention is directed at the present moment then being mindful should lead to decreased rumination and reduce pre and post-event processing which may exacerbate distress. Finally, since mindful attention is balanced then it should counter both under and over-engagement attention to social threat which is characteristic of social anxiety.

Decentering and Social Anxiety

Adopting a decentred perspective of mental experiences may support socially anxious individuals to better manage characteristic judgement and interpretation biases. Perceiving thoughts as mental events that are distinct from the self, may allow them to be considered

from an objective perspective. As a result conviction in the reality of socially anxious thoughts may reduce, along with associated distress.

Emotional and Behavioural Regulation and Social Anxiety

An intervention which facilitates emotion regulation could support socially anxious individuals to better manage their anxiety, by recognising it for what is, experiencing it without avoidance and consequently becoming desensitized to it through exposure. In addition, if mindful awareness supports individuals to adopt a decentred approach to their biased interpretations and cognitions, they may respond to these differently, either by altering thoughts, or by directing attention away from unhelpful thoughts. Mindfulness techniques such as focussed breathing might provide socially anxious individuals with an emotion regulation strategy which differs from usual habitual responses, for example directing attention at the breath rather than engaging in ruminative thought patterns. This alternative strategy might also reduce distress. Increased behavioural regulation would mean that socially anxious individuals would be more likely to engage in behaviours that aligned with their values. To the extent that these values included social participation then participants might engage in more social activity and alter habitual responses of social avoidance.

Self-Compassion and Social Anxiety

Self-compassion may arise from the generalisation of mindful acceptance of experience to acceptance of self. Increased self-compassion would counter socially anxious tendencies to be critical of one's social behaviour. A reduction in self-critical cognitions associated with social anxiety would most likely be associated with reduced anxiety related distress.

Studies of Mindfulness and Social Anxiety

A review of the literature using systematic review principles revealed that relatively few studies have systematically evaluated the efficacy of mindfulness interventions for people

with social anxiety. A search through Psychinfo and Medline databases was conducted using the following search terms: Social Anxiety or Social Phobia, and Mindfulness. Studies were included if they were published in a peer review journal and excluded if they were unpublished dissertations or theses. A total of six studies met the criteria. Only one of these studies (Bogels, Sijbers, & Voncken, 2006) was published at the onset of the current research.

Bogels, Sijbers, & Voncken (2006) evaluated a combined mindfulness and task concentration training (TCT) technique for this group. Participants were trained in mindfulness to develop awareness of themselves and their anxiety, and then subsequently trained in task concentration, which encouraged them to direct attention outside of themselves to aspects of the social setting. The intervention was conducted over nine therapy sessions. The combined approach was found to be effective in a sample of 9 participants with social anxiety disorder. However the efficacy of attentional strategies like TCT has been demonstrated previously in treating social anxiety (Wells et al., 1997) and it is not clear what effect a mindfulness only approach might have.

Koszycki, Benger, Shlik and Brawejin (2007) randomized 53 patients with social phobia to CBGT for social anxiety or MBSR. They found that, although both interventions led to similar improvements in mood, functioning and quality of life, participants in the CBGT group had significantly lower scores on measures of social anxiety. The authors concluded that, although MBSR may have some benefit to sufferers of SAD, CBGT remained the treatment of choice for social anxiety. Nonetheless, positive outcomes observed in this study suggest that another mindfulness-based intervention could be useful with this group. MBSR is a relatively intensive intervention and the benefits of a brief mindfulness intervention are not yet known. Koszycki and colleagues suggest that mindfulness training may be a useful adjunct to CBGT. A briefer mindfulness intervention may be particularly useful.

Kokovscki, Fleming and Rector (2009) conducted a feasibility study of Mindfulness and Acceptance-Based Group Therapy (MAGT) for social anxiety with a sample of 42

individuals with social anxiety disorder. MAGT is a recently developed 12 week approach incorporating elements of MBCT and ACT. Significant reductions in social anxiety, depression and rumination, and increases in mindfulness and acceptance were reported post-intervention. These results are limited however by the lack of a comparison group. In addition, the intervention also included ACT exercises (e.g., clarifying goals and values, interoceptive exposure). It is not clear therefore which aspects of the observed results related specifically to mindfulness training.

Piet, Hougaard, Hecksher, and Rosenberg (2010) conducted a randomized controlled trial of MBCT and a group-based CBT intervention in a sample of 26 individuals with social anxiety disorder. Participants were randomized into two groups and the study utilised a crossover design so that both groups received both treatments in reverse order. Both interventions led to reductions in social anxiety, and there was no significant difference between the effect size of either CBT ($d = 1.15$) or MBCT ($d = 0.78$) interventions. This suggests that both interventions were comparably effective, however the authors note that a significant difference may have been apparent if a larger sample group had been used. Once again, MBCT is a relatively intensive intervention incorporating aspects of CBT with Mindfulness training. It is not clear from this study what effect a brief mindfulness only intervention may have had.

Goldin, Ramel and Gross (2009) conducted an fMRI study of individuals with social anxiety disorder before and after completing an MBSR course. The study investigated the hypothesis that mindfulness training would lead to reductions in self-referential processing so that habitual tendencies to be critical of the self would be reduced. The authors reported an increase in positive self-views and a decrease in negative self-views post-intervention. This change in self-views occurred in conjunction with increased activity in neural areas associated with attention, and decreased activity in areas associated with self-processing and language processing. The authors suggested that this pattern of neural activity may reflect a reduction in narrative and conceptual processing of the self, allowing the possibility of greater experiential self-processing. Experiential processing of the self would allow socially

anxious individuals to process social experiences in a more objective way, less impacted by conceptualised understandings of themselves as social objects.

Recently Goldin and Gross (2010) conducted a follow up fMRI study of socially anxious MBSR completers exploring emotional reactions and regulation in response to negative self-beliefs. Participants were instructed to engage in either breath-focussed attention or a distraction task (counting backwards) in response to a negative self-belief. Post intervention participants reported lower levels of social anxiety, depression and rumination, and higher levels of self-esteem. During breath-focussed attention they also reported less negative emotion in response to negative self-beliefs and presented with reduced activation of the amygdala, a brain region involved in emotion, and increased activity in brain regions involved in attention. The authors concluded that MBSR may reduce emotional reactivity whilst enhancing emotion regulation. The results of both of these studies are limited once again however by the lack of any comparison group. As a result it is not clear whether the changes observed are specific effects of mindfulness training. In addition these studies tested specific hypotheses about mindfulness mechanisms, that they would reduce self referential processing and reactivity to negative beliefs, and did not explore other possible mechanisms (e.g., self compassion).

Overall these studies suggest that various forms of mindfulness training ranging from 8 to 12 sessions in duration generate positive outcomes for individuals with social anxiety. These outcomes include reductions in social anxiety, depression, rumination and increases in life satisfaction. Results of these studies also suggest that mindfulness may result in enhanced attention, reduced self-referential processing and reduced reactivity to negative beliefs.

All of the studies reported utilised relatively intensive multi-component mindfulness interventions. Where interventions included aspects of CBT (Piet et al., 2010) or ACT (Kocovski et al., 2009) it is not clear whether outcomes observed relate to mindfulness training, ACT or CBT components of the intervention. Similarly, as MBSR incorporates

training in a variety of mindfulness-oriented exercises it is not possible to assess different influences of each of these exercises on any outcomes observed. That is, it is not clear what impact yoga exercises may have had on outcomes relative to body scanning, mindful-eating or mindful-breathing tasks. None of the studies published to date demonstrate the impact of brief mindfulness training in a single mindfulness exercise. A brief mindfulness intervention would have the advantage of being a portable and accessible form of training. This sort of therapy might be particularly useful for socially anxious individuals who, as a result of social anxiety, may find it difficult to engage in more elaborate therapies that require greater social interaction and more prolonged attendance.

Several of these studies did not include a comparison group and therefore it is not clear whether outcomes observed related specifically to mindfulness or to some other element of the intervention (Bogels et al., 2006; Goldin & Gross, 2010; Goldin et al., 2009; Kocovski et al., 2009). The two studies that did utilise a comparison group compared an intensive mindfulness-based therapy to CBT. While these studies provide evidence regarding the efficacy of intensive mindfulness-based interventions relative to CBT the comparison of multi-component interventions means it is not possible to ascertain which aspects of which intervention led to which outcomes. Information on the effective components of treatment interventions is necessary in establishing new treatment protocols (Doss, 2004).

Social anxiety is maintained by over and under-engagement of attention, biased interpretation of social experiences and a self-critical perspective of one's social behaviour. This information processing style results in both anxious emotions and behavioural avoidance. Mindfulness may reduce both distress and avoidance associated with social anxiety by promoting; balanced attention, objective information processing, improved emotional and behavioural regulation and reduced self-criticism. In establishing the efficacy of mindfulness as an intervention for social anxiety research should consider not only treatment outcomes for social anxiety overall but for each of these hypothesised mechanisms. In this way, research may establish not only whether or not mindfulness is effective, but also how it generates these effects. Once mechanisms of change are better understood these can be further

examined through additional research programmes which aim to enhance and refine the overall treatment protocol (Doss, 2004).

Comparisons of brief interventions that use a single treatment modality allow the effectiveness of this treatment modality, and related mechanisms, to be investigated. To establish whether outcome effects relate to the intervention specifically it is essential that the intervention group is compared to a comparison group. Comparisons with other treatment interventions, matched for factors such as duration and frequency of contact, allow the efficacy or treatment specific components to be established.

For this reason, several studies investigating the effective components of mindfulness interventions have utilised relaxation interventions as comparison groups (Feldman et al., 2010; Jain et al., 2007). Although mindfulness and relaxation share similarities, the primary difference between them is that in relaxation the goal is for the individual to change the nature of their experience by inducing a state of physical relaxation. When practicing mindfulness, the intention is not to change anything, but simply to increase awareness of current experience. By including a relaxation condition it is possible for specific effects arising from mindfulness training to be observed (Feldman et al., 2010; Jain et al., 2007)

If studies utilise a treatment comparison condition only, it is not possible to know whether the effects observed are actually any better than doing nothing at all. For this reason a no-intervention condition (e.g., wait-list control groups) can provide useful information about whether outcome effects observed may arise over time irrespective of any intervention.

CHAPTER 5

PURPOSE OF THE CURRENT RESEARCH

The primary purposes of this study were to examine the effectiveness of mindfulness training in reducing the experience of social anxiety, and to evaluate what mechanisms might operate to invoke any changes. Because research to date has primarily evaluated the impact of relatively intense and elaborate programmes, it is not possible to identify how brief mindfulness training on its own, in the absence of other components of these therapies, might operate. The primary goal of this study was, therefore, to investigate the impact of mindfulness on its own in reducing symptoms of social anxiety. The advantages of this are twofold. Firstly it provides information on how mindfulness itself actually works. By understanding better what is happening therapeutic approaches can be developed that target mechanisms responsible for change. Secondly, it supports the development of a pared down and more cost effective therapeutic intervention by determining the minimal level of mindfulness training and understanding needed to help people cope with social anxiety.

In doing this we investigated whether brief mindfulness training increased mindfulness and reduced social anxiety. We also investigated whether brief mindfulness training resulted in changes to any of the hypothesised mechanisms of mindfulness including; attention, decentering, emotional and behavioural regulation and self compassion. Finally we investigated whether brief mindfulness training is an acceptable and useful intervention for adults in the general population classified as high in social anxiety.

In answering these questions data was collected for both primary outcomes (mindfulness and social anxiety) and secondary outcomes (attention, decentering, emotion regulation and self-compassion). We thereby hoped to contribute to the understanding of how mindfulness works as a therapeutic mechanism and what effect it might have on the experience of social anxiety.

CHAPTER 6

METHODOLOGICAL OVERVIEW

A randomized controlled trial (RCT) was conducted to examine the effectiveness of a mindfulness intervention in reducing experiences of social anxiety for adults in the general population classified as high in social anxiety.

Prior to commencing the RCT, it was necessary to establish the appropriate criterion score for social anxiety for the population, as this provided the basis for classifying participants as high in social anxiety. The Fear of Negative Evaluation survey (FNE) is widely used to classify non-clinical individuals as high or low socially anxious for research purposes (Han-Joo & Telch, 2008; Larkin, Ciano-Federoff, & Hammel, 1998; Mansell & Clark, 1999; Oaten, Williams, Jones, & Zadro, 2008; Spurr & Stopa, 2003; Vassilopoulos, 2005). A quartile cut-off for this measure is recommended (Stopa & Clark, 2001). New Zealand population norms have not been established for this measure however. The normative data that is available has been collected from American and British populations (Stopa & Clark, 2001; Watson & Friend, 1969). This may not be valid for a New Zealand population as differences between the cultural practices and ethnic makeup of each population might influence the distribution of scores. The primary aim of the first study phase was to establish appropriate inclusion criteria by surveying undergraduate psychology students from the University of Auckland with the FNE. A secondary aim was to collect data about the age and ethnicity of respondents so that the relationship of these to FNE scores could be investigated.

Training protocols and materials were created for mindfulness and relaxation conditions. These materials included handbooks describing intervention techniques and audio recordings with guided instructions to be used by participants when practicing techniques at home. Therefore, in the second study phase, we assessed the acceptability of measures and mindfulness and relaxation intervention protocols via a pilot study and a separate pilot test, assessing the comparability in acceptability and quality of the mindfulness and relaxation audio recordings.

The third study phase involved screening individuals to identify eligible participants for the RCT. Individuals interested in participating in the RCT were invited to complete an online screening tool that included the FNE and other measures including; the Self Compassion Scale (Neff, 2003a), the Mindful Attention Awareness Scale (Brown & Ryan, 2003), The Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), and the Post Event Processing Questionnaire (Fehm, Hoyer, Schneider, Lindeman, & Klusman, 2008). Those who scored above the cut-off were contacted and invited to participate in the RCT. The data from the online screening also provided the opportunity to assess the relationship between variables typically associated with mindfulness (e.g., self-compassion) and social anxiety (e.g., rumination after a social event). Evidence of hypothesised relationships (e.g., higher levels of mindfulness associated with lower levels of post event processing) would provide further support for the application of mindfulness training to the treatment of social anxiety. In addition demographic data collected as part of the online screening survey (e.g., gender, age, previous meditation experience) enabled the relationship between demographic characteristics and other variables to be examined. Where relationships between demographic characteristics and variables were identified these could provide additional information on the attributes of individuals endorsing variables associated with mindfulness and social anxiety. Finally, by comparing qualifying potential participants who choose to participate in the study with those who do not choose to participate, it is possible to explore variables and demographic characteristics distinguishing the groups, potentially identifying those who would not be willing to engage in a group intervention to reduce anxiety.

The final study phase involved the full RCT of mindfulness training for reducing social anxiety. Participants who met the eligibility criteria were allocated to one of three conditions; mindfulness, relaxation or wait-list control. All participants attended an initial training session and an experimental session 4 weeks later. Pre and post measures assessed change across several dimensions including mindfulness, social anxiety, attention, decentering, emotion and behaviour regulation and self-compassion.

Self-report questionnaires were completed at the beginning of both sessions and baseline heart rate and blood pressure recordings were taken on completion of these. Participants in intervention groups (mindfulness, relaxation) completed a practice log of time spent practicing their technique between training and experimental sessions. At the experimental session participants completed an emotional Stroop task and a public speaking task designed to induce feelings of social anxiety. Public speaking is the most commonly reported social fear for both socially anxious and normal populations (Furmark, Tillfors, Stattin, Ekselius, & Fredrikson, 2000; Mannuzza et al., 1995; Stein, Walker, & Forde, 1996). For this reason, impromptu speaking tasks are frequently used as laboratory social stressors (Abbott & Rapee, 2004; Abrams, Kushner, Medina, & Voight, 2002; Hofmann, Newman, Ehlers, & Roth, 1995; Parente, Garcia-Leal, Del-Ben, Guimaraes, & Graeff, 2005; Ronald M Rapee & Abbott, 2006) . Blood pressure data were collected before and after the speech, and additional self report measures administered evaluating aspects of information processing style in relation to the speech (e.g., awareness of anxiety symptoms, positive and negative self statements during public speaking) as well as the effectiveness of the technique and acceptability of the intervention for mindfulness and relaxation participants.

Data from the RCT were analysed to test the following predictions: Compared to participants in the relaxation and control conditions, participants in the mindfulness training condition would exhibit greater increases on measures of mindfulness, emotion regulation, self regulation and self compassion, and greater reductions on measures of social anxiety and over and under-engagement of attention. Compared to participants in relaxation and control conditions participants in the mindfulness condition would present with lower ratings of thought conviction and less autonomic reactivity to the speech task.

CHAPTER 7

STUDY PHASE 1: SURVEY TO ESTABLISH INCLUSION CRITERIA

Method

Participants

Prior to commencing the randomized controlled trial, 388 undergraduate psychology students from the University of Auckland completed the Fear of Negative Evaluation Survey (FNE; Watson & Friend, 1969) so that an upper quartile level could be established as a cut-off point for inclusion in to the trial. Of those who completed the survey, 23.7% were male and 76% female. Respondents ranged in age from 17 to 57. The mean age for respondents was 22 ($SD = 5.31$; Median age = 20). The majority (59.8%) of respondents identified their ethnicity as New Zealand European. The next largest ethnic group was Asian, which comprised 20.9% of the sample. The remaining respondents identified as Indian (5.9%), other European (4.9%), Pacific Island (2.3%), Maori (0.5%) or other ethnic group (5.7%).

The survey group used in study phase 1 was considered an appropriate sample for establishing the criterion for entry into the study phase 4 (the RCT) when screening interested potential participants with the online screening tool in study phase 3. It was intended initially that only undergraduate students would be recruited in to the trial during study phase 3. Inclusion criteria for study phase 4 were extended, however, after it became apparent that it would not be possible to recruit a sufficient sample of undergraduate students. Postgraduate students, university staff and members of the general public were also invited to complete the screening survey for the trial in study phase 3. Comparisons of the initial survey group and the sample who completed the screening in study phase 3 for the RCT revealed that the survey sample included higher numbers of women (76% versus 63.7%). A chi-square test indicated that there was a significant difference in the proportion of women in the screening sample as compared to the initial survey group; $X^2(1, n = 430) = 367.61, p < .01$. There were also a greater number of young people in the survey sample (87.9% versus 52.1% under the age of 25; $X^2(1, n = 430) = 518.36, p < .01$). Because higher rates of social anxiety are

typically experienced by these groups (Oakley Browne, 2006), the quartile cut-off established by this survey is likely to be conservative.

Measure: The Fear of Negative Evaluation Scale

The FNE (Watson & Friend, 1969) consists of 30 items measuring an aspect of social anxiety, the extent to which people are concerned about being evaluated negatively by others (See Appendix A). Items include, ‘I worry about what people will think of me even when I know it doesn’t make any difference’ and ‘I feel very upset when I commit a social error’. Item responses are either *true* or *false* and responses indicating a fear of negative evaluation score one point. Scores are totalled for the survey to generate an overall fear of negative evaluation score ranging from 0 of 30. Higher scores indicate greater fear of negative evaluation.

The FNE has been found to have good psychometric properties. It has internal consistency of $\alpha = 0.90$ and a test-retest reliability of $r = .78$ to $.94$ in an undergraduate population (Watson & Friend, 1969). In the current study Cronbach’s α was $.88$.

The FNE has been found to correlate significantly with other measures of social anxiety including the Social Phobia Scale and the Social Interaction Anxiety Scale in both community and undergraduate samples (Heimberg, Mueller, Holy, & Hope, 1992; Mattick & Clarke, 1998). It has also been found to identify individuals with social phobia as distinct from other anxious populations and non-clinical controls (Stopa & Clark, 2001). Outcome studies with socially phobic populations have found the FNE to be sensitive to treatment change (Butler, Cullington, Munby, Amies, & Gelder, 1984; Heimberg, Becker, Goldfinger, & Vermilyea, 1985; Mattick & Peters, 1988).

Analogous non-clinical populations are often used in social anxiety research since those who experience Social Anxiety are often reluctant to seek treatment (Wittchen et al., 1999), possibly because treatment necessitates social interaction. The analogous approach allows greater numbers of participants to participate in trials of interventions, and for treatment designs to be more experimental (Stopa & Clark, 2001). Individuals selected as either high or low social anxiety on the basis of their FNE scores differ significantly on other standardized social anxiety measures including the Social Avoidance and Distress Scale and the Social Phobia and Anxiety Inventory (Stopa & Clark, 2001; Turner, Beidel, Dancu, & Stanley, 1989). In addition, when participants are selected from the normal population on the basis of high and low FNE scores, the psychological processes found to distinguish these groups are similar to those that differentiate clinical social anxiety groups and controls (Stopa & Clark, 2001).

Some research shows that the reverse-worded items of the FNE may relate less directly to the underlying construct measured by the FNE and decrease the construct validity of the measure (Rodebaugh, Heimberg, Woods, Thissen, & Chambless, 2004). For this reason a brief version of the FNE has been created which uses 12 of the straight-forwardly worded items measured on a 1-5 likert scale (Leary, 1983). The BFNE, while psychometrically validated (Collins, Westra, Dozois, & Stewart, 2005; Duke, Krishan, Faith, & Storch, 2006), does not appear to have been used in the analogous research manner described above and for this reason the FNE rather than the BFNE was selected for use as both a screening and outcome measure in this study.

Procedure

A questionnaire containing the Fear of Negative Evaluation Survey measure and measures of demographic characteristics (see Appendix B) was distributed to members of undergraduate psychology classes at the University of Auckland in which the course co-ordinator had consented to survey distribution. Participants volunteered to complete the survey and remained behind after class had ended to do so. Participants were distributed paper versions

of the questionnaire and completed these anonymously, returning them to a drop off box outside the class door as they left.

Results and Discussion

Scores on the FNE ranged from 1 to 30. The mean was 15.03 and the standard deviation was 7.245. The distribution of FNE scores across the sample is presented in Figure 3.

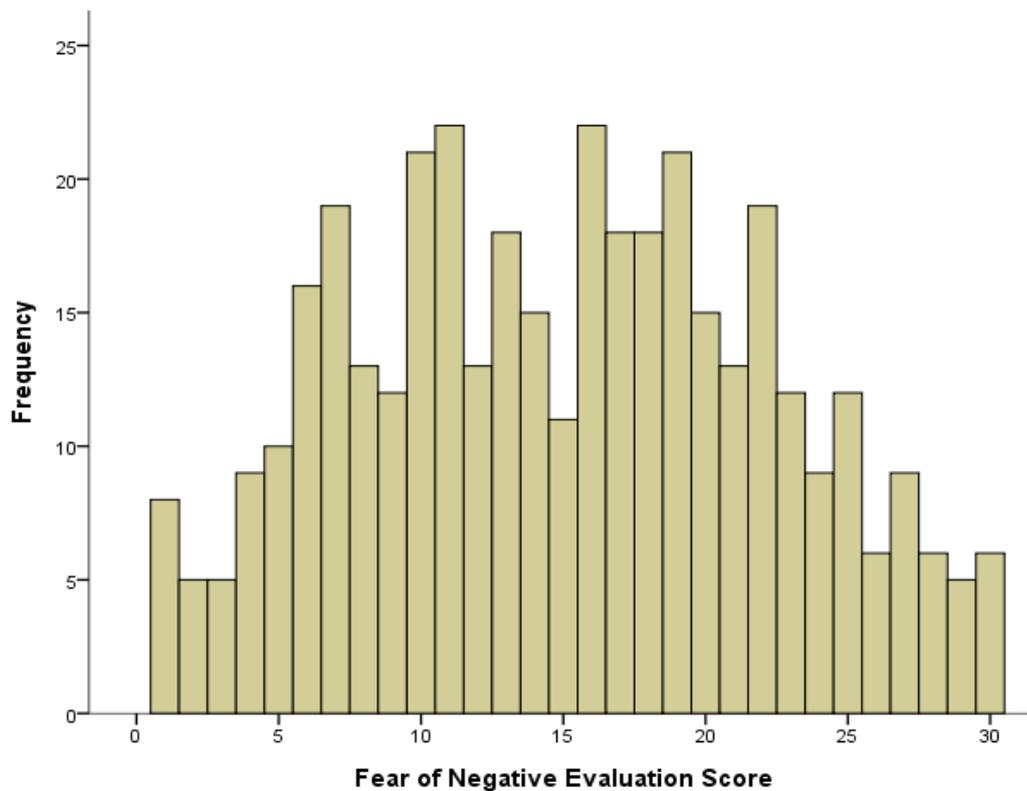


Figure 3: Distribution of scores on the Fear of Negative Evaluation survey in a sample of undergraduate students.

An independent samples t-test was conducted to compare FNE scores for males and females. There was a significant difference in scores for males ($M = 13.61$, $SD = 7.04$) and females ($M = 15.48$, $SD = 7.27$; $t(385) = -2.17$, $p = .03$, two tailed). This finding is consistent with

literature indicating that women experience higher rates of social anxiety than men (Fehm et al., 2005; Oakley Browne, 2006). A one way between groups ANOVA was conducted to explore the impact of ethnicity on FNE scores however no significant differences were found between ethnic groups. Finally, the relationship between age and FNE scores was examined using Pearson product-moment correlation coefficient. The relationship between age and FNE score was not significant; $r < .01$, $n = 388$, $p = .87$.

The upper quartile value for the sample was 20.75. Since scoring of the FNE is done in whole numbers this was rounded up and a score of 21 or higher became the inclusion criteria for the RCT. The distribution of scores found in the current sample is comparable with other populations. In a sample of American undergraduate students the mean FNE score was 15.47 ($SD = 8.47$). The mean score was also higher for women in this sample (16.10) than men (13.97). Similarly Stopa and Clark (2001) surveyed 208 British undergraduate students with the FNE and found an overall mean score of 14.26 ($SD = 6.27$), and a significant difference in scores between female ($M = 15.44$, $SD = 6.29$) and male respondents ($M = 12.70$, $SD = 6.24$). A 75th percentile value of 20 was established for this sample. Other studies applying FNE scores as criterion scores for classification of participants as high in anxiety have reported cut-off values of 17 in samples of British undergraduate students (Mansell et al., 1999; Winton, Clark, & Edelmann, 1995), 22 in an American sample (Han-Joo & Telch, 2008) and 23 in an Greek undergraduate sample (Vassilopoulos, 2005). In each of these studies however the strategy for establishing cut-off values is not specified so it is not clear whether these reflect upper quartile values for the populations sampled. Despite this, the results of the current study are comparable with the British sample described by Stopa and Clark (2001) and the American sample described by Watson and Friend (1969), suggesting that levels of social anxiety were similar across samples.

CHAPTER 8

STUDY PHASE 2: PILOT TESTING OF RCT PROTOCOLS AND MATERIALS

Assessment of the Mindfulness and Relaxation Audio Recordings

Prior to the study, audio CD's used in the mindfulness and relaxation conditions were reviewed and compared by 10 volunteer postgraduate students from the University of Auckland psychology department. This testing was necessary to ensure that the CD's were of comparable quality and acceptability. Each CD contained 15 minute voice recordings made by the experimenter of guided instructions for the corresponding technique (see Appendix C1 and C2 for the scripts and Appendix Y1 and Y2 for the CDs).

The CD for the mindfulness condition contained instructions for a focussed breathing exercise. These instructions were adapted from the mindfulness of the breath task utilised in Mindfulness Based Cognitive Therapy (Segal et al., 2002) and Mindfulness Based Stress Reduction (Kabat-Zinn, 2006). The instructions guided participants to direct their attention towards their breath and to notice each time their mind wandered, gently redirecting attention back to the breath whenever this happened. Scripts for the CD's were adapted from the MBCT and MBSR mindful breathing instructions and Jon Kabat-Zinn's audio recording for 'The Mindful Way Through Depression' (Williams, Teasedale, Segal & Kabat-Zinn, 2007)

The CD for the relaxation condition contained instructions for progressive muscle relaxation. These instructions were adapted from 'New Directions in Progressive Relaxation Training : a Guidebook for Helping Professionals' (Bernstein, 2000). The instructions guided participants to progressively tense and relax 16 muscle groups and to observe sensations associated with tension and relaxation as they did.

The volunteers listened to the mindfulness and relaxation audio CD's in their own time and rated their acceptability on a scale adapted from a measure used in previous research (Chan,

2007). The scale included 10 items assessing the acceptability and utility of the recordings. Items included ‘The voice in the recording motivates me to practice the technique’ and ‘The instructions are easy to follow’ (see Appendix D). Responses were made on a 5 point likert scale from 1 *strongly disagree* to 5 *strongly agree*. The item ratings were summed to generate total acceptability scores, which ranged from 42 to 50. The Cronbach’s α for the current sample was .80.

A paired samples t-test revealed no significant difference in acceptability ratings between the mindfulness CD ($M = 46.50, SD = 2.76$) and the relaxation CD ($M = 46.50, SD = 2.07$); $t(9) = 0.00, p = 1.00$. Overall, both recordings received comparable ratings of high acceptability.

Pilot Study of the RCT Protocol and Measures

Prior to commencing the RCT, acceptability of the protocols and measures was assessed via a pilot study of 6 volunteer postgraduate students from the psychology department at the University of Auckland. Three participants completed the mindfulness training protocol and 3 participants completed the relaxation training protocol. All 6 participants completed the study pre-test measures, practiced their technique for 4 weeks, and participated in the follow-up session during which they completed the outcome measures. The final study protocols and measures reported in Chapter 10 incorporate minor revisions made in response to the following feedback from these pilot test participants.

Results

When interviewed after the study pilot test participants in both conditions reported finding the intervention and experimental aspects of the study acceptable, engaging, and easy to understand. Questionnaire length was deemed appropriate and not too burdensome, and the questionnaires were regarded as clear and easy to follow. During the intervention session, pilot participants in the relaxation condition noted that they felt self-conscious tensing and relaxing facial muscles in front of the experimenter. For the purposes of the trial, therefore,

this experience was normalised and participants reassured that the experimenter would not be looking at their faces whilst they did this. Participants in both conditions reported finding intervention teaching and materials clear and useful. One participant in the mindfulness condition noted that a large amount of information was conveyed during the intervention teaching and suggested that by inviting questions from participants more often during teaching they may more readily grasp concepts or seek clarification. Consequently planned pauses for questioning were added to the teaching protocols for both conditions.

Both groups aimed to complete 15 minutes practice daily for 4 weeks as per the RCT. Most participants noted that they found it difficult to practice every day as unexpected events arose which required schedules to be changed. They noted however that they understood from the intervention session the importance of accurately recording practice times and felt comfortable doing so. All participants felt that the 15 minute practice duration was achievable and practiced at least 4 times per week. No change was made to the instruction that participants practice daily for the RCT although it was noted that many participants might not adhere to this requirement. The importance of noting practice times accurately continued to be emphasised within the protocol and participants reminded that they would gain more from the techniques if they adhered to daily practice.

At the experimental session, Stroop testing was done initially in an area separated from other participants by a screen. Although visually private this space was not sound proofed and participants noted that they felt self-conscious completing this task with other group members listening. Similarly, group members noted that they were distracted from questionnaire completion listening to participants completing the Stroop. Stroop testing was therefore conducted in a separate room away from other participants for the RCT. One participant in the relaxation condition felt they had not had an opportunity to convey their beliefs about whether the technique had helped them manage the speech task. Questions regarding this were added to questionnaire 3 for the purposes of the RCT.

CHAPTER 9

STUDY PHASE 3: ONLINE SCREENING OF INTERESTED POTENTIAL PARTICIPANTS

Method

Participants

Participants were recruited initially from the University of Auckland. Recruitment was conducted through the ‘CECIL’ research participants’ scheme. This scheme disseminates information about opportunities to participate in research to students in undergraduate psychology papers via email. Participants were also recruited via notices placed around the university psychology department and from the wider university community via email notification sent out on departmental distribution lists (see Appendix E1 – 3 for recruitment material). When it became apparent that an insufficient number of participants could be recruited from the University of Auckland alone, further participants were recruited from the wider community via a statement included in emails that said ‘please feel free to forward this email on to any other friends or family who you think might be interested in this project’. Participants were also recruited from Unitec and Massey University’s Auckland Campus via email and notices displayed around campus.

In total, 430 people completed the online screening survey. Men comprised 36.3% of the sample, women made up the remaining 63.7%. Respondents ranged in age from 16 – 75 years of age ($M = 27.60$, $SD = 9.96$, Median = 24.00). Overall 43.1% of the sample identified their ethnicity as New Zealand European, 25.9% identified their ethnicity as Asian, and the remainder of the sample identified their ethnicity as other European (12.7%), Maori (4.9%), Pacific Island (4.2%), Indian (4.0%) or other ethnicity (5.1%). The sample consisted predominately of university students (73.3%). The remainder of the sample were either university staff (11.6%) or members of the general public (15.1%). Overall 32.6% of the sample had participated in yoga before, 24.7% had participated in meditation and 24.4% had participated in martial arts.

Procedures

Potential participants interested in being involved in the study were sent a link to an online screening survey. Individuals were informed that the researcher was seeking participants who scored within a targeted range on this survey and were invited to complete it online. They were informed that if their score fell in the targeted range they would be contacted and invited to participate in a study about strategies to manage anxiety. Interested potential participants were told that participants in this study would learn one of two techniques to help them manage anxiety in social and performance situations, and that they would be asked to practice this technique for 4 weeks, before attending a final 2 hour experimental session at which they could try using the technique they had learned in a situation that might previously have been challenging. Interested potential participants were also informed that some participants would be placed in a control condition in which they would attend both sessions and learn techniques at the end of these (see Appendix E1, E2 and E3 for recruitment material; as well as Appendix F1 for the participant information sheet and Appendix F2 for the consent form for the online screening study). Participants who scored 21 or higher on the FNE were emailed and invited to participate in the RCT.

In addition to the FNE, measures of self-compassion (Self-compassion scale; Neff, 2003a) mindfulness (Mindful Attention Awareness Scale; Brown & Ryan, 2003), life satisfaction (Satisfaction With Life Scale; Diener et al., 1985), and rumination after a social event (Post-event Processing Questionnaire; Fehm et al., 2008) were included in the online screening survey in conjunction with a measure of demographic characteristics. These measures were included so that relationships between variables typically associated with mindfulness (mindfulness, self compassion) and social anxiety (fear of negative evaluation, post event rumination) could be explored. It was hypothesised that these variables would be negatively related to each other. In addition, relationships between these variables were compared to a measure of wellbeing, life satisfaction. It was hypothesised that life satisfaction would be positively related to variables associated with mindfulness and negatively related to variables associated with social anxiety.

Demographic information was collected to explore any differences between demographic groups on variables related to mindfulness or social anxiety. Demographic data included questions about whether or not participants had ever participated in yoga, meditation or mindfulness. The purpose of including these questions was to explore the relationship between previous experience of these activities and variables associated with mindfulness. Since these activities originate from eastern philosophical traditions it was hypothesised that respondents with experience of these activities would score higher on variables associated with mindfulness. Data collected in the online screening survey also provided baseline information for individuals participating in the randomized controlled trial.

Measures

Self-Compassion Scale

The Self-Compassion Scale (SCS; Neff, 2003a) is a 26 item, self-report scale measuring the tendency to be compassionate towards oneself (see Appendix G). The SCS includes 6 subscales measuring self-kindness (e.g., ‘I’m kind to myself when I’m experiencing suffering’), self-judgment (e.g., ‘when I see aspects of myself I don’t like I tend to be down on myself’), common humanity (e.g., ‘I try to see my failings as part of the human condition’), isolation (e.g., ‘when I’m struggling I tend to feel like other people must be having an easier time of it’), mindfulness (e.g., ‘when I fail at something important I try to keep things in perspective’) and over-identification (e.g., ‘when I’m feeling down I tend to obsess and fixate on everything that’s wrong’). Responses reflect the extent to which the individual feels each statement describes an aspect of their thinking or behaviour. Responses are rated on a 5 point likert scale from 1 (*almost never*) to 5 (*almost always*). A total scale score can be calculated by reverse scoring items from the self-judgement, isolation and over-identification scales and summing these with items on other scales (Neff, 2003a).

Previous research has found an acceptable level of internal consistency for the subscales, with Cronbach’s α ranging from .75 to .81. Test-retest reliability was demonstrated over a 3 week period for the overall SCS ($r = .93$), and subscales (r ’s = .80 - .88) (Neff, 2003a). In the

current sample, the Cronbach's α were; .82 for the self kindness subscale, .77 for the self judgment scale, .83 for the common humanity subscale, .73 for the isolation subscale, .77 for the mindfulness subscale and .79 for the over-identification subscale. The overall Cronbach α for all items of the SCS was .92.

Construct validity of the SCS has been demonstrated through significant negative correlations with; the rumination scale of the Ruminative Response Scale; ($r = -.51$; Nolen-Hoeksma & Morrow, 1991) and thought suppression, as measured by the White Bear Suppression Inventory ($r = -.37$, Wegner & Zanakos, 1994). Positive associations have been found between the SCS and each subscale of the Trait Meta Mood Scale (attention $r = .41$, clarity $r = .43$, repair $r = .55$; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995), as well as the Satisfaction with Life Scale ($r = .45$; Diener et al., 1985).

Construct validity was further demonstrated by the ability of the SCS to distinguish between groups anticipated to have different levels of self-compassion (Neff, 2003a). Because self-compassion is a construct derived from Buddhist psychology it was expected that Buddhist practitioners would have higher levels of self-compassion than an undergraduate population unfamiliar with the concept. Buddhist practitioners were found to have significantly higher SCS scores than undergraduates, including significantly higher scores on the positive subscales (self-kindness, common humanity and mindfulness) and significantly lower scores on the negative subscales (self judgment, isolation, and over-identification). There was also a significant correlation between SCS scores and years of practice in the Buddhist sample.

Mindful Attention Awareness Scale

The Mindful Attention Awareness Scale (MAAS; Brown & Ryan 2003) is a 15 item measure of mindfulness (see Appendix H). Specifically it evaluates an individual's tendency to be attentive to, and aware of, experiences in everyday life. It includes items such as, 'I find it difficult to stay focussed on what's happening in the present' and 'I forget a person's name as

soon as I've been told it for the first time'. These items reflect a construct which is the opposite of mindfulness since the concept of 'mindlessness' is thought to be more accessible to individuals (Brown & Ryan, 2003). Respondents indicate how frequently they have each of these experiences on a 6 point likert scale from 1 (*almost always*) to 6 (*almost never*). Higher scores indicate a greater tendency toward mindfulness. The scales authors note that other aspects of mindfulness, such as acceptance were not included in the MAAS as they wanted to identify 'foundational' mindfulness components of present-centred attention and awareness.

The MAAS has a single-factor structure (Brown & Ryan, 2003; Carlson & Brown, 2005; MacKillop & Anderson, 2007), and good internal consistency, with previous studies reporting Cronbach's α ranging from .82 and .86 (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Brown & Ryan, 2003). In the current sample Cronbach's α was .86. Test-retest reliability has been demonstrated in an undergraduate population over a four week period ($r = .81$; Brown & Ryan, 2003).

Construct validity of the MAAS has been demonstrated through positive correlations with each subscale of the Trait Meta-Mood Scale (attention $r = .19$, clarity $r = .49$, repair $r = .37$; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995), and other measures of mindfulness including the Freiburg Mindfulness Inventory ($r = .31$; Buchheld, Grossman, & Walach, 2001) and the Kentucky Inventory of Mindfulness ($r = .51$; Baer, Smith, & Allen, 2004) (Baer et al., 2006). The MAAS correlates negatively with the rumination subscale of the Rumination Reflection Questionnaire ($r = -.39$, Trapnell & Campbell, 1999). In addition MAAS scores were found to be higher in mindfulness practitioners than community matched controls (Brown & Ryan, 2003).

MacKillop and Anderson (2007) found that the MAAS did not correlate significantly with meditation experience in an undergraduate population. By using the MAAS for this study we hoped to assess baseline levels of everyday mindfulness for participants, and potential

participants, prior to their involvement in the study. In addition, by using the MAAS as a post-intervention measure in the RCT we sought to assess the extent to which mindfulness skills learned via the intervention were incorporated into daily experience.

Satisfaction With Life Scale

The satisfaction with life scale (SWLS; Diener et al., 1985) is comprised of 5 items including, ‘In most ways my life is ideal’ and ‘I am satisfied with my life’ (see Appendix I). Responses are rated on a 7 point likert scale between 1 (*strongly disagree*) and 7 (*strongly agree*). Internal consistency ranging from .79 - .88 has been demonstrated over a range of studies (Pavot & Diener, 2008). In the current study the Cronbach α was .88. Test-retest correlations have been found over a one month period (r 's = .80 -.84) and over a 4 year period ($r = .54$; Pavot & Diener, 2008) suggesting that the construct is stable over shorter time periods but may change over the course of a lifetime. The SWLS correlates positively with other measures of subjective wellbeing including positive affect ($r = .47$; Watson, Clark, & Tellegen, 1988) and self esteem ($r = .64$, Rosenberg, 1989). All 5 items have been found to correlate with a single factor accounting for .66 of the total variance (Diener et al., 1985).

Fear of Negative Evaluation Survey

Please refer to the description of the FNE in chapter 6, pages 56.

Post -Event Processing Questionnaire

The post-event processing questionnaire (PEPQ; Fehm et al., 2008) measures tendencies to engage in negative rumination after a social event (see Appendix J). Respondents are asked to recall a social situation in which they experienced anxiety and provide answers to 17 items including, ‘Did you try to resist thinking about the event?’ and ‘If you repeatedly thought about the event, did your feelings about the event worsen?’

Responses were originally collected on a 0 – 100 likert scale where 0 was *none, never* or *not at all* and 100 *very strong* or *always*. In the current sample responses were collected on an 10 point likert scale from 1, *Do not agree at all* to 10, *Agree extremely* and items were phrased as statements (e.g., ‘I tried to resist thinking about the event’ and ‘Repeatedly thinking about the event made my feelings about it get worse’) so that the response format for this measure was compatible with others in the screening survey.

All items of the PEPQ have been found to correlate significantly with social anxiety as measured by the FNE ($r = .19 - .32$; Fehm et al., 2008). In addition items have been found to correlate significantly with general anxiety and depression as measured by the Hospital Anxiety and Depression Scale ($r = .34$; Zigmond & Snaith, 1983). Correlations remained significant for social anxiety when other variables were entered as covariates but not for general anxiety and depression. A four factor model consisting of cognitive impairment, negative self-perception, thoughts about past and future social events, and avoidance has been proposed by the authors. Fehm and colleagues (2008) report an internal consistency of .9 for the PEPQ. In the current sample the Cronbach α was .93.

Demographic Characteristics and Personal History

Demographic information was provided by all interested potential participants during the screening phase (see Appendix K). This group provided information about their age, gender, and ethnicity and were asked to indicate whether they were a staff member or student at a tertiary institute. Respondents were also asked to indicate whether they had tried yoga, meditation or martial arts previously.

Analytical Strategy

Pearson’s correlations were calculated to assess relationships between variables associated with mindfulness (MAAS, SCS), variables associated with social anxiety (FNE, PEPQ) and life satisfaction (SWLS). Correlations were significant at the .001 level. An independent

samples t-test was calculated to compare scale scores for males and females. In addition, a series of one way ANOVA were conducted to explore the impact of ethnicity on scale scores, as well as the impact of a respondent being a student, staff member or member of the general public. An independent samples t-test was conducted to compare scale scores for respondents who had and had not participated in yoga, meditation or martial arts previously, revealing a significant difference in age. A series of ANCOVA were then conducted where age was the covariate, comparing scale scores for those with and without yoga, meditation and martial arts experience. Prior to conducting these analyses preliminary checks were done to ensure that the ANCOVA assumptions regarding, normality, linearity and homogeneity of variances and homogeneity of regression slopes were met. These assumptions were met with the exception of two variables. For respondents with and without meditation experience there was a significant interaction between SWLS and age, as well as the isolation subscale of the SCS and age. These interactions violated the assumption of homogeneity of regression slopes. One way ANOVA were conducted for these two variables instead.

Results

Overall 47.9% of the sample had FNE scores above the criterion cut-off. Of those that qualified for participation in the RCT, 36.9% were male and 63.1% were female. The mean age of qualifying respondents was 27.41 years ($SD = 10.42$, Median = 23.00). Overall 44.9% of qualifying respondents identified their ethnicity as New Zealand European, 22.9% identified their ethnicity as Asian, and the remainder of the sample identified their ethnicity as other European (13.2%), Maori (6.8%), Pacific Island (2.0%), Indian (5.9%) or other ethnicity (4.4%). Qualifying respondents were predominantly students (74.8%). The remainder of those that qualified were either university staff (12.6%) or members of the general public (12.6%). Overall 31.6% of qualifying respondents had participated in yoga before, 18.4% had participated in meditation and 25.7% had participated in martial arts.

Correlations Between Measures

Pearson's correlations were calculated to assess relationships between variables. Table 1 presents correlations between variables associated with mindfulness (MAAS, SCS), variables associated with social anxiety (FNE, PEPQ), and life satisfaction (SWLS).

Table 1

Inter-correlations Between the Mindfulness Attention Awareness Scale, Self Compassion Scale Total Score, Fear of Negative Evaluation Scale, Post-event Processing Questionnaire and Satisfaction with Life Scale

Measure	1	2	3	4	5
1. MAAS ^a ($M = 53.31, SD = 11.72$)	-	.44**	-.40**	-.42**	0.40**
2. SCS –Total ^b ($M = 74.25, SD = 15.51$)		-	-.61**	-.49**	.51**
3. FNE Scale ^c ($M = 19.34, SD = 6.91$)			-	.57**	-.45**
4. PEPQ –Total ^d ($M = 102.68, SD = 32.03$)				-	-.34**
5. SWLS ^e ($M = 20.69, SD = 7.19$)					-

** $p < .01$. $N = 430$. ^aMindful Attention Awareness Scale, ^bSelf-Compassion Scale, ^cFear of Negative Evaluation Survey, ^dPost-Event Processing Questionnaire, ^eSatisfaction with Life Scale

All correlations were in the hypothesised directions. As expected, there was a strong positive correlation between the two variables associated with social anxiety (FNE and the PEPQ), indicating that respondents who reported higher levels of rumination after a social event also reported greater fear of negative evaluation. There was also a moderate positive relationship between the two variables associated with mindfulness (MAAS and SCS), indicating that respondents who reported greater awareness of daily experiences tended to report higher levels of self compassion. Negative correlations were found between variables associated with social anxiety (FNE, PEPQ) and variables associated with mindfulness (MAAS, SCS),

indicating that participants who reported higher levels of social anxiety (i.e., fear of negative evaluation by others and rumination after a social event) tended to report lower levels of mindfulness (i.e., awareness of daily experiences and self compassion). Finally, as anticipated, life satisfaction correlated positively with variables associated with mindfulness (MAAS, SCS) and negatively with variables associated with social anxiety (FNE, PEPQ). These results indicate that constructs related to mindfulness and social anxiety are inversely related and that mindfulness, but not social anxiety is associated with overall life satisfaction.

Comparisons of Scale Scores for Demographic Groups

Independent samples t-tests were then conducted to compare scale scores for males and females but no significant differences were found. One way between groups ANOVA were also conducted to explore the impact of ethnicity on scale scores as well as the impact of a respondent being a student, staff member or member of the general public. In all cases no significant differences were found between groups. These results suggest that different demographic groups reported comparable levels of social anxiety, rumination after a social event, mindfulness, and self compassion.

Comparisons of Scale Scores and Age for Respondents With and Without Yoga, Meditation and Martial Arts Experience

A series of independent samples t-tests and one way ANCOVA were conducted to explore differences in age and scale scores for respondents with and without yoga, meditation and martial arts experience. An independent samples t-test revealed that participants who had tried meditation, yoga or martial arts previously ($M = 28.52$, $SD = 9.70$) tended to be older than those who had not ($M = 26.51$, $SD = 10.26$; $t(426) = 2.059$, $p = 0.04$, two tailed). Subsequent ANCOVA comparisons were then conducted with age as a covariate.

A series of one way ANCOVA compared respondents with and without yoga experience on measures of social anxiety, rumination after a social event, mindfulness, self-compassion and life satisfaction, with age included as a covariate. Adjusted means and standard errors are

presented in table 2. Results indicated that after controlling for age, there were significant group differences. Respondents with yoga experience had higher scores on the mindfulness subscale of the SCS and lower scores on the avoidance subscale of the PEPQ relative to those without yoga experience. In addition, differences between the groups approached statistical significance for the SCS self-kindness subscale, PEPQ cognitive impairment and PEPQ negative self-perception subscales. Respondents with yoga experience reported higher levels of self-kindness, and lower levels of cognitive impairment and negative self-perception after a social event, relative to those without yoga experience. There were no significant differences on other scores.

One way ANCOVA also compared respondents with and without meditation experience on measures of social anxiety, rumination after a social event, mindfulness, self-compassion and life satisfaction, with age included as a covariate. Adjusted means and standard errors are presented in table 3. Results indicated that, after controlling for age, there were significant group differences. Respondents with meditation experience had lower scores on the FNE; the cognitive impairment, negative self-perception, and avoidance subscales of the PEPQ as well as lower PEPQ total scores relative to those without meditation experience. Respondents with meditation experience also had higher scores on the MAAS relative to those without meditation experience. In addition differences between the groups approached statistical significance for the SCS self-kindness subscale. Participants with meditation experience reported higher levels of self-kindness than those without meditation experience. The one-way ANOVA conducted to explore the relationship between previous meditation participation and life satisfaction measured by the SWLS revealed a statistically significant difference in SWLS scores for those who had and had not tried meditation previously. Respondents with meditation experience reported higher levels of life satisfaction than those without meditation experience.

Finally a series of one way ANCOVA compared respondents with and without martial arts experience on measures of social anxiety, rumination after a social event, mindfulness, self-compassion and life satisfaction, with age included as a covariate. Adjusted means and

standard errors are presented in table 4. Results indicated that after controlling for age there was a significant difference between the two groups on the SWLS. Respondents with martial arts experience tended to report higher levels of life satisfaction than those without martial arts experience. There were no significant differences on other scores.

Overall these results suggest that previous experience of meditation or martial arts is associated with greater life satisfaction, and that experience of mediation or yoga is associated with lower levels of avoidance and rumination after a social event. In addition meditation experience is associated with lower levels of cognitive impairment (e.g., concentration difficulties) and negative self perception after the same event and less fear of negative evaluation by others. Finally these results suggest that both meditation and yoga experience may be associated with higher levels of mindfulness as respondents with meditation experience reported higher levels of mindful awareness of daily experiences, and respondents with yoga experience reported more mindful awareness of painful experiences.

Table 2

Adjusted Means and Standard Errors on the Fear of Negative Evaluation Scale, the Self Compassion Scale, the Mindful Attention Awareness Scale, the Satisfaction With Life Scale and the Post-Event Processing Questionnaire for Respondents With and Without Yoga Experience

Yoga Experience		MAAS ^a	SCS SK ^b	SCS SJ ^c	SCS CH ^d	SCS IS ^e	SCS MF ^f	SCS OI ^g	SCS Total ^h	FNE ⁱ	PEPQ CI ^j	PEPQ NS ^k	PEPQ PF ^l	PEPQ AV ^m	PEPQ Total ⁿ	SWLS ^o
Yes ¹	M	53.58	15.44	16.72	12.91	13.88	13.86	13.80	75.75	19.07	40.92	23.94	23.82	9.37	98.07	21.66
	(SE)	(.99)	(.34)	(.32)	(.30)	(.27)	(.25)	(.29)	(1.32)	(.58)	(1.34)	(.70)	(.69)	(.46)	(2.70)	(.61)
No ²	M	53.12	14.69	16.91	12.68	14.09	13.21	13.95	73.50	19.57	43.87	25.57	24.72	10.92	105.09	20.23
	(SE)	(.69)	(.24)	(.22)	(.21)	(.18)	(.18)	(.20)	(.92)	(.41)	(.93)	(.48)	(.48)	(.32)	(1.88)	(.42)
<i>F</i>		.15	3.34	.24	.38	.41	4.55*	.17	1.94	.50	3.23	3.63	1.16	7.50**	4.55*	3.23

* $p < .05$. ** $p < .01$. ¹ $n=139$. ² $n=287$. ^aMindful Attention Awareness Scale. ^{b-h}Self Compassion Scale. ^bself-kindness. ^cself-judgement. ^dcommon humanity. ^eisolation. ^fmindfulness. ^gover identification. ⁱFear of Negative Evaluation Survey. ^{j-n}Post Event Processing Questionnaire. ^lcognitive impairment. ^knegative self-perception. ^lthoughts of past and future. ^mavoidance. ^oSatisfaction With Life Scale.

Table 3

Adjusted Means and Standard Errors on the Fear of Negative Evaluation Scale, the Self Compassion Scale, the Mindful Attention Awareness Scale, the Satisfaction With Life Scale and the Post-Event Processing Questionnaire for Respondents With and Without Meditation Experience

Meditation Experience		MAAS ^a	SCS SK ^b	SCS SJ ^c	SCS CH ^d	SCS IS ^{e†}	SCS MF ^f	SCS OI ^g	SCS Total ^h	FNE ⁱ	PEPQ CI ^j	PEPQ NS ^k	PEPQ PF ^l	PEPQ AV ^m	PEPQ Total ⁿ	SWLS ^{o†}
Yes ¹	M	55.38	15.53	16.40	13.00	13.75	13.69	13.63	76.23	17.77	39.21	23.20	23.28	9.39	95.19	22.10
	(SE)	(1.17)	(.40)	(.37)	(.36)	(3.28)	(.30)	(.35)	(1.56)	(.69)	(1.58)	(.83)	(.81)	(.55)	(3.18)	(7.35)
No ²	M	52.57	14.74	17.01	12.67	14.13	13.33	13.99	73.59	19.95	44.14	25.62	24.81	10.76	105.32	20.31
	(SE)	(.66)	(.23)	(.21)	(.20)	(3.14)	(.17)	(.20)	(.87)	(.39)	(.88)	(.47)	(.45)	(.31)	(1.79)	(7.17)
<i>F</i>		4.23*	2.86	1.86	.64	1.19	1.07	.79	2.11	7.43**	7.19**	5.73*	2.65	4.49*	7.48**	4.54*

* $p < .05$. ** $p < .01$. ¹ $n=106$. ² $n=321$. ^aMindful Attention Awareness Scale. ^{b-h}Self Compassion Scale. ^bself-kindness. ^cself-judgement. ^dcommon humanity. ^eisolation. ^fmindfulness. ^gover identification. ⁱFear of Negative Evaluation Survey. ^{j-n}Post Event Processing Questionnaire. ^jcognitive impairment. ^knegative self, ^lthoughts of past and future. ^mavoidance. ^oSatisfaction With Life Scale. [†] $M (SD)$ from one-way ANOVA as ANCOVA assumption of homogeneity of regression slopes was violated for these variables

Table 4

Adjusted Means and Standard Errors on the Fear of Negative Evaluation Scale, the Self Compassion Scale, the Mindful Attention Awareness Scale, the Satisfaction With Life Scale and the Post-Event Processing Questionnaire for Respondents With and Without Martial Arts Experience

Martial Arts Experience		MAAS ^a	SCS SK ^b	SCS SJ ^c	SCS CH ^d	SCS IS ^e	SCS MF ^f	SCS OI ^g	SCS Total ^h	FNE ⁱ	PEPQ CI ^j	PEPQ NS ^k	PEPQ PF ^l	PEPQ AV ^m	PEPQ Total ⁿ	SWLS ^o
Yes ¹	M	52.82	14.94	16.78	12.27	13.99	13.78	13.61	74.61	19.26	41.72	24.77	23.89	10.32	100.70	21.96
	(SE)	(1.16)	(.40)	(.37)	(.35)	(.31)	(.30)	(.34)	(1.53)	(.67)	(1.56)	(.81)	(.79)	(.54)	(3.14)	(.71)
No ²	M	53.42	14.94	16.88	12.91	14.04	13.31	14.00	74.12	19.46	43.30	25.13	24.61	10.45	103.49	20.30
	(SE)	(.65)	(.22)	(.21)	(.20)	(.18)	(.17)	(.20)	(.87)	(.38)	(.89)	(.46)	(.45)	(.31)	(1.78)	(.40)
<i>F</i>		.20	.00	.06	2.57	.02	1.95	.95	.08	.06	.77	.15	.60	.05	.59	4.13*

* $p < .05$. ** $p < .01$. ¹ $n=105$. ² $n=322$. ^aMindful Attention Awareness Scale. ^{b-h}Self Compassion Scale. ^bself-kindness. ^cself-judgement. ^dcommon humanity. ^eisolation. ^fmindfulness. ^gover identification. ⁱFear of Negative Evaluation Survey. ^{j-n}Post Event Processing Questionnaire. ^jcognitive-impairment. ^knegative self, ^lthoughts of past and future. ^mavoidance. ^oSatisfaction With Life Scale

Comparisons of Qualifying Respondents Who Did and Did Not Choose to Participate in the RCT

A series of independent samples t-tests and chi-square tests were conducted to explore group differences on measures of social anxiety, rumination after a social event, mindfulness, self-compassion, life satisfaction and demographic characteristics for qualifying respondents. All of the 206 participants who qualified for the RCT were emailed and invited to participate in the RCT. Of these, 79 chose to participate and commenced the RCT. Independent samples t-tests and chi-square tests were conducted to compare differences between those who did (participants) and did not choose to participate (non-participants) in the RCT. No statistically significant differences were found between participants and non-participants on gender, ethnicity, or whether they were staff, students or members of the general public. There were no statistically significant differences between participants and non-participants on any of the scale scores with one exception, participants ($M = 11.65$, $SD = 5.37$) tended to score lower on the avoidance subscale of the PEPQ, than non-participants ($M = 13.23$, $SD = 4.83$; $t(204) = -2.14$, $p = .03$, two-tailed). These results indicate that non-participants were more likely to report avoiding participation in particular social activities (e.g., attending parties, public speaking) after a negative experience at a similar activity.

Discussion

The pattern of results observed via correlational analyses of the measures supports the hypothesis that mindfulness and social anxiety are inversely related. This inverse relationship provides further support for the application of mindfulness training to social anxiety. Overall mindfulness appeared to be associated with qualities not typically found in individuals with social anxiety (i.e., increased life satisfaction and self compassion, reduced post event rumination) suggesting that strategies to increase mindful attention may be beneficial for this group.

Similarities in mean scores across different demographic groups suggest that each experienced comparable levels of social anxiety, rumination after a social event, mindfulness,

and self-compassion. However differences for those with and without experience of yoga meditation and martial-arts suggest associations between participation in these activities and psychological wellbeing. Present centred awareness is a component of each of these activities, reflecting their origins in eastern culture. Those who had tried meditation previously tended to score higher on mindful attention (the MAAS), while those who had tried yoga previously did not score higher on the MAAS but did score higher on the mindfulness component of the self compassion scale. Although both scales deem to measure mindfulness they differ in their approach. While the MAAS assesses straightforward attention to daily experience (e.g., I rush through activities without really being attentive to them) the mindfulness subscale of the SCS assesses a particular way of paying attention to painful experiences, through balanced awareness (e.g., When something upsets me I try to keep my emotions in balance). The different pattern of scores observed on these measures may reflect this difference, such that, those who have tried meditation report higher levels of awareness to everyday experience while those who have tried yoga are more likely to manage painful experiences with balanced awareness.

There are several reasons why participants with and without experience of these activities may have presented with this different pattern of results. It may be that beneficial effects of these activities give rise to the pattern of positive outcomes observed, for example, participating in yoga increases life satisfaction. Alternatively it may be that those who are attracted to these activities are already experiencing these elements of psychological wellbeing prior to their participation, indeed such attributes might make participation easier. Finally there may be some other untested variable such as a personality component that contributes to the pattern of findings observed. A more detailed investigation might clarify this relationship. One limitation of this study is that only basic information about activity participation was collected. Further detail about the style of yoga, meditation or martial arts practiced as well as the frequency and duration of any participation would be valuable to furthering our understanding regarding the benefits of these activities.

The finding that non-participants scored higher on the avoidance subscale of the PEPQ suggests that this group were more likely to avoid a social event after a negative experience with a similar social event. Given that those qualifying for the study were classified as high in social anxiety then it may be possible to infer that this group considered a variety of past social experiences to be negative. If so then this tendency to avoid further experiences may constitute a more general tendency towards social avoidance. This tendency towards social avoidance may have contributed to this group's non-participation in the RCT.

A further limitation of this study is that participants completing the screening tool presumably did so because they were interested in participating in the RCT. As such this may have attracted a specific cohort of respondents and the results observed may relate to specific attributes of this cohort. In addition the sample consisted predominantly of university students and it is not clear whether the same pattern of results would be observed in community sample.

Nonetheless, the results of the screening trial provided both a pool of potential participants for the RCT and some preliminary support from correlational analyses for the implementation of a mindfulness-based approach to the management of social anxiety. The effectiveness of this approach was then examined in the RCT.

CHAPTER 10

STUDY PHASE 4: RANDOMIZED CONTROLLED TRIAL OF MINDFULNESS INTERVENTION FOR SOCIAL ANXIETY - METHODOLOGY

Participants

The flow of participants through the study is presented in Figure 4. Of the 79 people who commenced the study, 39.2% were male and 60.8% were female. They ranged in age from 18 – 65 years of age. The mean age of participants was 27.7 years ($SD = 10.26$, median = 23.00). Overall 51.9% of the sample identified their ethnicity as New Zealand European, 25.3% as Asian and the remainder of the sample identified their ethnicity as other European 15.2%, Maori 2.5%, or Indian 5.1%.

The majority of the sample were students 58 (73.4%) and most of these (52) were from the University of Auckland. Of the remaining six students four were from Unitec, one was from Massey, and one attended a private tertiary institute. The remainder of the sample comprised nine staff from tertiary institutions (seven from the University of Auckland and two from Massey) and 12 members of the general public.

Participants were randomly assigned to one of three conditions; mindfulness intervention (27), relaxation intervention (28), or wait-list control (24). Of the 79 participants who commenced the study 63 completed it (79%); 22 in the mindfulness condition, 21 in the relaxation condition and 20 in the control condition.

Overall, 21% of the sample dropped out of the study. Reasons cited for dropping out of the study included illness, work and study commitments and difficulty attending the experimental session (e.g., car broken down, flight delayed). Two participants, both from the mindfulness condition, stated that they did not wish to continue with the study after the training session as they did not believe the intervention was useful to them. Some participants may have dropped

out of the study because they were anticipating a stressor at the experimental session, described in the participant information sheet as ‘a task that may previously have been challenging’. For ethical reasons it was necessary that participants knew that this would occur however some participants may have chosen not to attend the experimental session as a result of concerns about this. Apprehension about the task was reported by a number of study completers.

A series of t-tests and chi-square analyses were conducted to compare baseline data for those who did (completers) and did not complete the study (non-completers). Significant group differences were revealed. Non-completers ($M = 12.48$, $SD = 4.70$) tended to report less self-kindness during suffering than completers ($M = 14.67$, $SD = 3.49$; $t(77) = 2.18$, $p = .03$), as measured by the SCS self-kindness subscale. They also reported greater over-identification with painful emotions ($M = 16.75$, $SD = 2.88$) than completers ($M = 14.81$, $SD = 2.92$ $t(77) = -2.39$, $p = .03$), as measured by the over-identification subscale of the SCS. Finally non-completers ($M = 61.38$, $SD = 14.67$) reported lower overall levels of self-compassion than completers ($M = 70.51$, $SD = 12.31$; $t(77) = 2.55$, $p = .01$) as measured by the SCS total scale score. No other significant differences were found.

Ethical consent for the study was obtained from the University of Auckland Human Participants Ethics Committee. Funding for the study was provided by University of Auckland via the author’s Postgraduate Research Student Support account. Data for the RCT was collected between 10 September 2008 and 24 October 2009. Data collection took place at the University of Auckland psychology department.

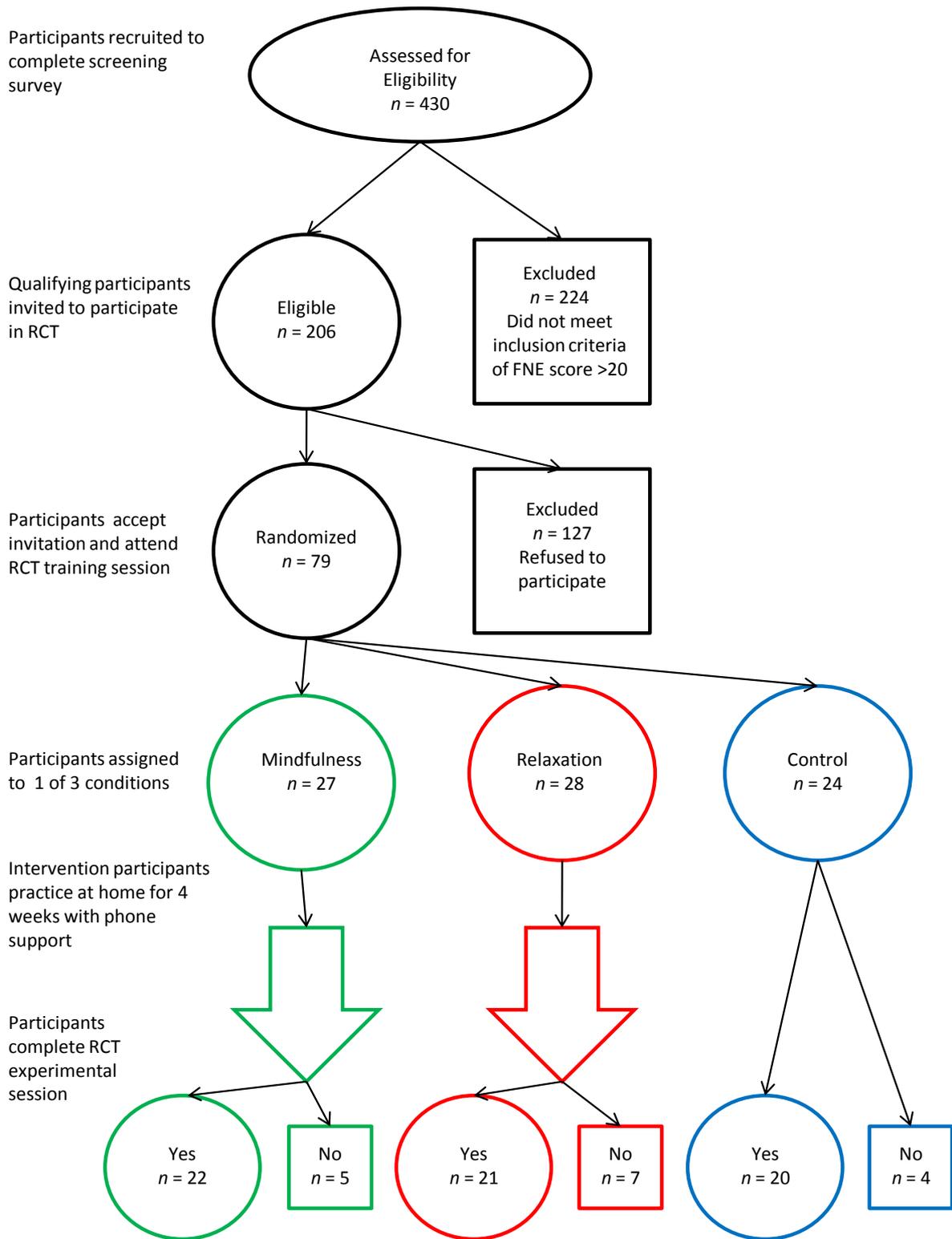


Figure 4. Diagram depicting the flow of participants through the screening phase and randomized controlled trial

Design

A randomised controlled trial with 3 x 2 design included the between subjects factors of intervention condition (mindfulness, relaxation or waitlist control) and within subjects factors of assessment time points (pre-intervention baseline measures collected during the screening phase and initial training session, and post intervention measures collected during the follow up experimental session). The primary dependent measures were mindfulness and social anxiety. The secondary measures were attention, emotion regulation and self compassion.

In addition, the study included the collection of log data on daily use of the intervention practices during the 4 week intervention; these log data were used to compare intervention adherence for mindfulness and relaxation conditions. The study also included the collection of data from an emotional Stroop task conducted at the follow up experimental session to compare differences in attention between the three conditions post intervention, and data relating to an experimental stressor (impromptu speech task) at the experimental session. These data were collected to compare anxiety, positive and negative self statements and thought conviction in relation to the speech between groups. Finally, data were also collected on the perceived effectiveness and acceptability of the techniques and training to compare acceptability of the intervention conditions.

Interventions

Mindfulness Condition

Participants in the mindfulness condition were provided with materials for learning and practicing a 15 minute mindful breathing exercise. These materials included a handbook (see Appendix M1) and an audio CD (see Appendix Y1) to support their practice of the technique at home. Participants were provided with these materials and presented with a rationale as to why this technique might support them to manage anxiety in social situations. This rationale was included in both the handbook and the experimenter's teaching protocol (see Appendix

N1). Information for the handbook and protocol was adapted from MBSR (Kabat-Zinn, 1994) and MBCT (Segal et al., 2002).

Participants were given the opportunity to ask questions as the handbook information was conveyed. Afterwards they practiced the mindful breathing exercise in session. Meditation cushions were provided and participants were asked to sit either on these or on an upright chair as they preferred. Before commencing the exercise the experimenter spent time supporting the participants to find a comfortable seated position that allowed them to remain upright and alert whilst also relaxed and comfortable.

Instructions for the mindful breathing exercise were adapted from the mindfulness of the breath task utilised in MBCT (Segal et al., 2002) and MBSR (Kabat-Zinn, 2006). A primary focus of this technique is to teach participants to direct their attention towards the breath and to notice each time their attention wanders, gently redirecting their attention back to the breath each time this happens (Kabat-Zinn, 1994, 2006; Segal et al., 2002).

This form of mindfulness was chosen as it is one of the primary forms of traditional mindfulness training (Kapleau, 1965), and one of the first forms of mindfulness taught in the MBSR and MBCT programs (Kabat-Zinn, 1994, 2006; Segal et al., 2002). In addition studies have demonstrated changes to information processing (emotion regulation and decentring) after a single instance of brief (8-15 minute) training in this technique (Arch & Craske, 2006; Broderick, 2005; Erisman & Roemer, 2010; Feldman et al., 2010). A breathing exercise also had the advantage of being a portable feature that can be integrated directly into a social situation.

Participants were asked to listen to the audio CD and practice their technique at home once each day for the next 4 weeks. The final pages on the handbook contained a practice log in which participants were asked to record the amount of time spent practicing their technique

each day. Participants were strongly encouraged to record this honestly and informed that participants would be asked to return their logs to a collection box at the experimental session, rather than the experimenter, with the intention that this would further support honest recording of practice times. Training took approximately one hour.

After the training session each participant was contacted once per week by phone to see how practice was going and check whether participants had any questions or concerns. Some participants were difficult to contact by phone. If a participant could not be contacted one week a message was left and the participant encouraged to call or email with any problems. If this same participant could not be contacted for a second week they were emailed and encouraged to respond, even if they were not having any difficulties.

Input into the design and content of the handbook and protocol was provided prior to the trial by two independent individuals with expertise in mindfulness. One expert consultant is a clinical psychologist with several years of personal and therapeutic experience with mindfulness. The other expert is a health psychology researcher with personal experience in mindfulness practice as well as professional training in MBSR. In addition, the experimenter was a clinical psychology doctoral candidate with personal training and experience in mindfulness practice.

Relaxation Condition

Participants in the relaxation condition were provided with materials for learning and practicing a 15 minute progressive relaxation exercise. These materials included a handbook (see Appendix M2) and an audio CD (see Appendix Y2) to support their practice of the technique at home. Participants were provided with these materials and presented with a rationale as to why this technique might support them to manage anxiety in social situations. This rationale was included in both the handbook and the experimenter's teaching protocol (see Appendix N2). Information for the handbook and protocol was adapted from 'New

Directions in Progressive Relaxation Training : a Guidebook for Helping Professionals' (Bernstein, 2000).

Participants were given the opportunity to ask questions as the handbook information was conveyed. Afterwards they practiced the progressive relaxation exercise in session. Blankets were provided and participants were asked to either lie on these or sit in a chair as they preferred. A primary focus of progressive relaxation is to teach participants to progressively tense and relax 16 muscle groups, observing sensations of tension and relaxation in each muscle group as they do. Participants then spend time relaxing and experiencing the sensations associated with relaxation in each muscle group.

Participants were asked to listen to the audio CD and practice their technique at home once each day for the next 4 weeks. The final pages on the handbook contained a practice log in which participants were asked to record the amount of time spent practicing their technique each day. Once again, participants were strongly encouraged to record this honestly and informed that participants would be asked to return their logs to a collection box at the experimental session rather than the experimenter. Training took approximately one hour.

Relaxation participants were also contacted once per week by phone. Once again, if a participant could not be contacted one week a message was left and the participant encouraged to call or email with any problems. If this same participant could not be contacted for a second week they were emailed and encouraged to respond, even if they were not having any difficulties.

Control Condition

Participants in the wait-list control condition did not learn a technique at the intervention session. After completing baseline measures and learning that they would be in the wait-list

control condition, participants in this condition were told that they would be able to leave the training session early as they did not need to stay and learn a technique. They were informed that they would not be contacted in the 4 weeks between the intervention and experimental sessions other than to be sent an email reminder about the final session three days before it took place. Participants in this condition were told that they would instead learn both techniques at the end of the experimental session in four weeks time, after they completed all experimental tasks.

Measures

A summary of all measures used in the RCT is provided in table 5.

Mindful Attention Awareness Scale

Please refer to the description of the MAAS in Chapter 9 pages 65 – 66.

Fear of Negative Evaluation Survey

Please refer to the description of the FNE in Chapter 7 pages 56 -57.

Social Avoidance and Distress Scale

The Social Anxiety and Distress Scale (SADS) is a 28 item measure of social avoidance and distress (see Appendix O). Items include ‘I tend to withdraw from people’ and ‘I often find social occasions upsetting’. Item responses are either *true* or *false* and responses indicating social avoidance or distress score one point. Scores are totalled to generate an overall rating from 0 of 28. Higher scores indicate greater anxiety and avoidance of social situations. The SADS has a test- retest reliability of 0.68 to 0.79 (Watson & Friend, 1969). In the current sample Cronbach α was 0.88. The SADS is sensitive to treatment change (Butler et al., 1984; Heimberg et al., 1985; Mattick & Peters, 1988).

Table 5

Pre and Post-intervention Data Collection Points for RCT measures

Measure	Administered Pre-intervention	Administered Post-intervention
Mindful Attention Awareness Scale	Online screening	Questionnaire 2
Fear Negative Evaluation Scale	Online screening	Questionnaire 2
Social Avoidance and Distress Scale	Questionnaire 1	Questionnaire 2
Heart Rate and Blood Pressure	On completion of questionnaire 1	On completion of questionnaire 2, announcement of participant's speech turn, after rehearsing technique or waiting (control group) and immediately after speech.
Anxiety Symptoms Ratings	-	Questionnaire 3
Rumination Reflection Questionnaire, rumination subscale	Questionnaire 1	Questionnaire 2
White Bear Suppression Inventory	Questionnaire 1	Questionnaire 2
Stroop	-	Administered after Questionnaire 2 prior to speech
Thought conviction	-	Questionnaire 3
Trait Meta Mood Scale	Questionnaire 1	Questionnaire 2
Self Statements during Public Speaking Scale	-	Questionnaire 3
Self Compassion Scale	Online screening	Questionnaire 2
Practice Log	Completed during 4 week practice period	
Evaluations of Intervention Efficacy	-	Questionnaire 3 (excludes control)
Evaluation of the Technique and Training	-	Questionnaire 3 (excludes control)

- Pre-intervention data was not collected for these measures

Heart Rate and Blood Pressure

Heart rate and blood pressure were measured with an Omron IA1B Automatic Blood Pressure Monitor. Measures of heart rate and blood pressure are indicants of an individual's autonomic reactivity and as such can provide an objective measure of a person's emotional arousal. As a result they can distinguish between those individuals presenting with genuine reports of emotional well-being (e.g., feeling calm), and those who present as such via self-report measures because they are in denial about their distress (Shedler, Mayman, & Manis, 1993). This is possible because psychological defensiveness such as denial is associated with physiological costs including increased autonomic reactivity (Pennebaker & Susman, 1988; Shedler et al., 1993).

Anxiety Symptoms Ratings

Anxiety and perceived physiological responses to anxiety were assessed using a measure adapted from Maus and colleagues (2004; See Appendix P). Participants completed 5 items rating how anxious they were feeling, and specifying the extent to which they experienced racing heart, blushing, sweaty palms and shortness of breath on a 11 point likert scale between 0 (not at all) and 10 (extremely). In the current sample Cronbach's α for this measure was .86.

Rumination Reflection Questionnaire – Rumination Subscale

The Rumination Reflection Questionnaire (Trapnell & Campbell, 1999) is a 24 item measure comprised of two subscales measuring two different forms of self attention; rumination and reflection. Only the rumination subscale was relevant to the current research and therefore only this subscale was included. This 12 item subscale measures the individual's tendency toward over-engaging attention with aspects of neurotic self-consciousness (see Appendix Q). It includes items such as 'My attention is often focussed on aspects of myself I wish I'd stop thinking about' and 'I spend a great deal of time thinking back over my embarrassing or disappointing moments'. Higher scores indicate a greater tendency towards rumination.

Responses are collected on a 5 point likert scale between (1) *strongly disagree* and (5). *strongly agree*. Trapnell and Campbell (1999) found the RRQ has good convergent and discriminate validity and internal consistency of .88. In the current sample internal consistency was demonstrated via a Cronbach alpha coefficient of .82.

White Bear Suppression Inventory

The White Bear Suppression Inventory is a 15 item self-report measure of the extent to which an individual suppresses unwanted thoughts or deliberately under-engages with, and avoids unwanted thoughts (Wegner & Zanakos, 1994; See Appendix R). Initial factor analyses conducted by Wegner and colleagues established that thought suppression could be distinguished from related constructs including, negative affect, emotion inhibition, mood control and behavioural will power (Wegner & Zanakos, 1994). Test re-test reliability was demonstrated in a sample of 162 undergraduates at 1 week, 3 weeks and 3 months with correlations ranging from .69 to .92. Convergent validity was demonstrated via significant positive correlations with Beck Depression Inventory ($r = .45$, Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), Maudsley Obsessive Compulsive Inventory ($r = .40$) (Sternberger & Burns, 1990) and the State Trait Anxiety Inventory ($r = .53$; Spielberger, Gorsuch, & Lushene, 1970). Internal consistency was demonstrated in the current sample via a Cronbach α of 0.85.

Stroop Task

Participants completed a Stroop colour naming exercise adapted from Mattia and colleagues (Mattia et al., 1993) as a measure of hypervigilance and over-engagement with social threat (See Appendix S1 – S6). In this task participants are presented with six sets of emotionally threatening and neutral words printed in different ink colours. Participants were asked to name the colour of words including; a set of physically threatening words (insane, illness, doctor, hospital, fatal), a set of socially threatening words (boring, stupid, foolish, inferior, failure) and a set of colour words (pink, orange, blue, black and green). Physically and socially threatening word sets were paired with sets of control words matched for their

number of syllables, letters, and frequency of usage in the English language (Mattia et al., 1993). Colour names were matched with groups of 5 X's. Words were printed in pink, green, blue, orange or black ink. They were presented on laminated A4 cards and printed in 18 point Arial font. Each page contained 17 rows of 6 words, making a total of 102 trials. Words were arranged randomly but distributed so that every colour appeared at least once on each line, and matching colours and words were never directly adjacent to each other. In addition, each colour or word appeared twice on not more than four lines (Hope, Rapee et al., 1990). Before commencing the task, participants were presented with 5 groups of Z's printed in the colours described above and asked to name these. They were then told that these were the only colours used in the task and reminded to name the colours as quickly and as accurately as they could. Participants read the words out left to right and top to bottom. The experimenter timed with a stopwatch and timing began when the first colour word was named and stopped as the last colour word was said aloud.

Thought Conviction

Participants completed a measure of thought conviction adapted from Wells and Papageorgiou (2001). Participants listed three thoughts they could recall having during the speech. Participants were asked to rate the extent to which they believed each thought on an 11 point likert scale from 0 (don't believe the thought at all) to 10 (entirely convinced that the thought is true; see Appendix T).

Trait Meta-Mood Scale

The Trait Meta-Mood Scale (TMMS) is a 30 item measure of perceived emotional intelligence (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). It contains three subscales measuring attention to feelings (attention), clarity about emotional states (clarity) and the ability to repair negative moods (repair) (See Appendix U). Attention subscale items include 'I pay a lot of attention to how I feel' and 'I often think about my feelings'. This subscale assesses the extent to which respondents pay attention to their emotional experience rather than avoiding or under-engaging with it. Clarity subscale items include "I usually know my

feelings about a matter” and” I am rarely confused about how I feel”. This subscale measures the respondent’s ability to discriminate among emotional states. Since problems with emotion discrimination have been associated with dysfunctional forms of emotion regulation (Taylor, 2000) then greater clarity about emotions suggests enhanced emotion regulation. Finally, repair subscale items include “I try to think good thoughts no matter how badly I feel” and “Although I am sometimes sad I have a mostly optimistic outlook”. This subscale assesses the respondents ability to engage in effective emotion regulation strategies to manage negative mood states. Responses are collected on a 5 point likert scale between 1 *strongly disagree* and 5 *strongly agree*.

Construct validity of the TMMS was demonstrated in a sample of 86 undergraduate students (Salovey et al., 1995) via positive correlations between the attention subscale and a measure of private self consciousness (Self-Consciousness Scale, $r = .42$, Fenigstein et al., 1975); the repair subscale and measures of mood regulation (Negative Mood Regulation scale, $r = .53$; Catanzaro & Mearns, 1990); and negative correlations between the clarity subscale and a measure of emotional ambivalence (Ambivalence about Emotional Expressiveness Scale, $r = .25$, King & Emmons, 1990). Internal consistency of the TMMS was demonstrated in the current sample via Cronbach’s α of .84.

Self-Statements During Public Speaking Scale

The self-statements during public speaking scale (SSPS; Hofmann & DiBartolo, 2000) is a 10 item measure comprised of two, 5 item subscales assessing positive and negative self-statements during public speaking (See Appendix V). Respondents are asked to recall their thoughts during a speaking exercise and rate the extent to which they agree or disagree with a series of statements. Items on the positive self-statement subscale (SSPS-P) include ‘Even if things don’t go well, it’s no catastrophe’ and ‘Instead of worrying I could concentrate on what I want to say’. Items on the negative self-statements subscale include (SSPS-N) ‘What I say will probably sound stupid’ and ‘I’m a loser’. Responses are collected on a six point likert scale between 0, *do not agree at all* and 5, *agree extremely*. Reliability of the scale was

demonstrated via Cronbach's α of .73 for the SSPS-P subscale and .87 for the SSPS- N subscale in the current sample. Significant changes to scores on the negative subscale were demonstrated in a socially anxious population pre and post-treatment but not on the positive subscale suggesting that the measure is sensitive to treatment changes in this population (Hofmann & DiBartolo, 2000). SSPS-N scores have also been found to differentiate high and low socially anxious participants on a public speaking task.

Self-Compassion Scale

Please refer to the description of the SCS in Chapter 9, pages 66 – 62.

Practice Log

Participants recorded the total time spent practicing their technique each day in a practice log at the back of the intervention handbook. This also contained space for comments on that day's practice although these were not included in the final analyses. Participants were encouraged to use the comments space to note down anything they wanted to discuss during the weekly phone call.

Evaluations of Intervention Efficacy

After completing the public speaking task participants in the mindfulness and relaxation conditions completed an evaluation of the intervention's efficacy (see Appendix W). This measure included 3 items. Participants were asked to rate the extent to which they thought practicing their technique helped them to feel less anxious while waiting to speak and during the speech, and to perform better on the speech. Responses were collected on an 11 point likert scale from 0, *not at all*, to 10, *extremely*.

Evaluation of the Technique and Training

Participants completed an evaluation of the technique and training rated on a 5 point likert scale between 1 (*strongly disagree*) and 5 (*strongly agree*; see Appendix X). Participants rated the extent to which they; enjoyed learning the technique, felt that the technique was taught in a way they could understand, felt the CD and handbook helped them understand and practice their technique, helped them manage their anxiety over the 4 week practice period, intended to continue practicing the technique in the future, and would recommend the technique to other people.

Procedure

Overview

Participants were clustered into groups of 2 to 5 participants based on their stated availability to attend training sessions. Each group of participants attended two data collection sessions at the University of Auckland, 4 weeks apart.

Training Session

The first session was described as a training session. At this session each participant received a participant information sheet (see Appendix L1) and signed a consent form (See Appendix L2). Participants were informed that they would be asked to complete an initial screening questionnaire and would have their heart rate and blood pressure measured before learning which condition they were in. They were told that the condition they had been allocated was written on a piece of paper and had been placed in a sealed envelope by a colleague of the experimenter from the University of Auckland psychology department who was not associated with the study in anyway. Therefore the experimenter was also unaware of the condition to which the group had been allocated. The group were informed that the envelope would be opened once everyone in the group had completed the questionnaire and had their blood pressure measured. They were reminded that they might be learning one of two techniques to manage anxiety in social situations, or that they might be allocated to a control

condition, in which they would not learn any techniques at that session but would learn both techniques in 4 weeks time at the end of the experimental session. Participants were then distributed questionnaire 1 and asked to complete the self-report measures within this. Questionnaire completion took 10 – 25 minutes. Data from the online screening survey was combined with this questionnaire to establish baseline levels for all measures. As they completed questionnaire one each participant had their blood pressure and heart rate measured and recorded on the front of their questionnaire booklet. Each participant was allocated a unique code that could be assigned to all of their data so that their identity would remain anonymous. This code was noted on the participant's questionnaire, practice log and all other data generated at later sessions.

Once blood pressure and heart rate had been measured for every group member the experimenter opened the sealed envelope to reveal which condition the group had been allocated. Groups allocated either the mindfulness or relaxation techniques stayed on to learn their technique. Groups allocated the control condition finished at this point.

Experimental Session

Exactly 4 weeks after the training session the same group of participants met again to complete the experimental session for the study. On arrival participants in the mindfulness and relaxation conditions were asked to return their practice logs to a drop off box placed to one side of the room. They were informed that they would be asked to complete two questionnaires during the experimental session and to participate in two experimental tasks. They were also informed that their heart rate and blood pressure would be measured several times during the session. Participants were then asked to complete questionnaire 2.

As each participant completed this questionnaire their heart rate and blood pressure was measured and they completed the emotional Stroop task in an adjacent room, separate from the rest of the group.

Once all of the participants had completed the Stroop task they were told that the next part of the experiment would be an impromptu speech. Participants were told that they would be asked to speak for 3 minutes (Abbott & Rapee, 2004; Britt, Cohen, Collins, & Cohen, 2001; Hofmann et al., 1995; Ronald M Rapee & Abbott, 2006; Ronald M Rapee & Lim, 1992) on the pros and cons of living in Auckland (Hirsch, Mathews, Clark, Williams, & Morrison, 2006). This topic was chosen as it was thought to be emotionally neutral and all participants would be equally able to discuss it (Parente et al., 2005). Participants were informed that the speech would be filmed so that the experimenter, and other members of the experimenter's research team, could evaluate each participant's performance afterwards. Video-taping of public speaking exercises, either genuinely or as a deception, is a commonly used experimental design to induce public speaking anxiety in studies of groups or individuals (Abrams et al., 2002; Britt et al., 2001; Hazlett-Stevens & Borkovec, 2001; Helmus, Tancer, & Johanson, 2005; Hirsch et al., 2006; Hofmann et al., 1995; Parente et al., 2005). In reality participants were not filmed. A genuine camera was used and switched on but contained no tape to record on. Participants were given blank paper and allowed 3 minutes to plan their speech. Speech notes were then collected from participants, so that they could not continue rehearsing the speech, and each participant was then called randomly to present their speech.

Before speaking, the participant had their blood pressure and heart rate measured again, and then left the room for three minutes. Participants in the two intervention conditions were instructed to rehearse their technique during this time while those in the wait list control condition were instructed just to wait (Hazlett-Stevens & Borkovec, 2001; Hirsch et al., 2006). Once three minutes were up the participant was called in to the room and had their heart rate and blood pressure measured again. They were then asked to stand and give their speech to the other participants in the group and the camera. Participants were asked to speak for 3 minutes. Participants who stopped speaking before 3 minutes was over were prompted to continue and to add any further points they could think of or provide a summary of their main ideas. Participants were stopped when they had spoken for 3 minutes.

At the end of the impromptu speaking exercise participants were given another questionnaire evaluating their experience of the public speaking exercise and the intervention. Once all participants had completed the impromptu speaking exercise they were debriefed on the deception used in pretending to film the speech, and a rationale for the deception was provided. Participants were invited to ask questions about this or express any concerns they had.

Participants were then taught the other technique, or in the case of control participants, both techniques. They were provided with the information booklet and audio CD for this technique and invited to contact the researcher if they had any ongoing concerns or queries about the technique.

Analytical Strategy

Statistical analyses were conducted using version 18 of the Statistical Package for Social Sciences (SPSS). Prior to commencing any analyses the data set was screened for missing data. Any data that was missing was replaced by calculating the individual's mean score for remaining items and substituting this value for the missing data. Statistical assumptions of homogeneity and normality of data and homogeneity of variance were tested prior to analyses. These assumptions were not violated with the exception of positive skew for baseline blood pressure measures, and negative skew detected in the pre-intervention attention subscale of the TMMS. In all instances skew was corrected by truncating outliers to the next nearest value. The same process was followed for correcting outlying values in other variables. In instances where truncating did not effect the overall pattern of results, original data were reported. The only variable for which truncation did effect outcomes was diastolic blood pressure. Truncated data is therefore reported for this variable.

A series of between subjects ANOVAs and chi-square analyses were then conducted to assess condition differences on all pre-test measures. This was done to ensure that the

randomization process was successful in ensuring that groups were equivalent prior to the intervention. Associations between baseline variables were explored using a Pearson product moment coefficient and descriptive data generated for all variables including practice log data.

A series of repeated measures ANOVA were conducted to determine group differences on measures of mindfulness, anxiety and potential mindfulness mechanisms (attention, decentering, emotional and behavioural regulation, and self compassion). Simple effects analyses were conducted to follow up any Time X Group effects. Simple effects analyses were also conducted to follow up Time X Group trends given that the small sample size was likely to have reduced power and increased the chance of type II errors.

Finally, independent samples t-tests between relaxation and mindfulness groups were conducted to compare variables related to the acceptability and utility of the techniques (i.e., practice log data, evaluations of intervention efficacy, evaluations of the technique and training).

CHAPTER 11

STUDY PHASE 4: RESULTS

Baseline Measures

Randomization Check

Means and standard deviations on all pre and post-intervention RCT measures for participants who completed the study are presented in tables 6 and 7. One way ANOVAs were conducted comparing the three conditions in terms of baseline attributes. No significant differences were found between conditions on any of the baseline variables including measures of baseline mindfulness, social anxiety, heart rate and blood pressure, attentional style, emotional intelligence, self-compassion, and age. Chi-square analyses were conducted to compare demographic characteristics of each group and once again no significant differences were found for gender, ethnicity, or staff, student, general public status or previous experience of yoga, meditation or martial arts. These results suggest that the randomization process was successful at ensuring the three condition groups were equivalent at baseline.

Correlations Between Measures at Baseline

Associations between baseline variables were explored using a Pearson product moment coefficient. Correlations between the MAAS, FNE, SADS, heart rate, blood pressure, RRQ, WBSI and TMMS are presented in table 8. Correlations between these measures and the SCS total scale score and subscales are presented in table 9. Correlations between SCS total scale score and subscales are presented in table 10.

Positive associations were found between MAAS and the clarity and repair sub-scales of the TMMS, but not the attention subscale. The MAAS was also associated with the common humanity subscale of the SCS but not with any of the other subscales of this measure or the SCS total score. As expected, there was a positive association between the two measures of

social anxiety; the FNE and the SADS. In addition the FNE was positively associated with heart rate, the rumination subscale of the RRQ, the WBSI and the over-identification subscale of the SCS. Negative associations were found between the FNE and the clarity sub-scale of the TMMS, the self-kindness and common humanity subscales of the SCS as well as the total SCS score. Positive associations were found between the SADS and the WBSI. The SADS was not associated with any other measures. Positive associations were also found between heart rate and both the rumination subscale of the RRQ and the self-judgement subscale of the SCS. A negative association was found between heart rate and the SCS total score. As expected there was a strong positive association between systolic and diastolic blood pressure. Neither systolic nor diastolic blood pressure was associated with any other variable. The rumination subscale of the RRQ was positively associated with the WBSI as well as the self-judgement, isolation and over-identification subscales of the SCS. In addition negative associations were found between the rumination sub-scale and the clarity and repair subscales of the TMMS, the self-kindness, common humanity, and mindfulness subscale of the SCS, as well as the SCS total score. There was a negative association between the WBSI and the self-kindness subscale of the SCS. The attention subscale of the TMMS was positively associated with both the common humanity and over-identification subscales of the SCS. The clarity subscale of the TMMS was positively associated with both the self-kindness subscale of the SCS and the SCS total score. The clarity subscale was negatively associated with self-judgement and over-identification subscales of the SCS. Finally the repair subscale of the TMMS was positively associated with the self-kindness, common humanity and mindfulness subscales of the SCS, and negatively associated with the SCS self-judgement and isolation subscales.

When examining correlations between the SCS and subscales, anticipated positive associations were found between positively worded subscales (self-kindness, common humanity and mindfulness) and the total scale score, and anticipated negative associations were found between negatively worded subscales (self-judgement, isolation, over-identification) and the total scale score. The self-kindness subscale was negatively associated with self-judgement, isolation and over-identification subscales, and positively associated with common humanity and mindfulness subscales. The self-judgement subscale was

negatively associated with the mindfulness subscale and positively associated with the over-identification subscale. As expected, the common humanity subscale correlated negatively with the isolation subscale. It also correlated positively with the mindfulness subscale. Positive associations were found between the isolation subscale and the over-identification subscale. No association was found between mindfulness and over-identification subscale. Although these scales were intended to counter each other with regard to the constructs they assess, this pattern of results is consistent with findings that SCS subscale measure 6 separate factors (Neff, 2003a) .

Practice Log Data

Independent samples t-tests were conducted to compare time spent practicing the techniques by mindfulness and relaxation groups. No significant differences were found in total minutes spent practicing for relaxation ($M = 273.15$, $SD = 102.79$) and mindfulness participants ($M = 281.91$, $SD = 98.93$; $t(40) = .281$, $p = .78$, two-tailed). The magnitude of the differences in the means was small (mean difference = 8.76 , 95% CI -54.17 to 71.69). Significant differences were not found for average minutes spent practicing each week either for relaxation ($M = 68.29$, $SD = 25.70$) and mindfulness group participants ($M = 70.48$, $SD = 24.73$; $t(40) = .281$, $p = .78$, two-tailed). Again the magnitude of differences in means was small (mean difference = 2.19, 95% CI -13.54 to 17.92).

Table 6

Pre and Post-intervention Means and Standard Deviations for the Mindful Attention Awareness Scale, Fear of Negative Evaluation Survey, Social Avoidance and Distress Scale, Heart Rate and Blood Pressure, Rumination Subscale of the Rumination Reflection Questionnaire, White Bear Suppression Inventory, and Trait Meta-Mood Scale

	Mindfulness Pre-intervention ¹ <i>M (SD)</i>	Mindfulness Post-intervention ¹ <i>M (SD)</i>	Relaxation Pre-intervention ² <i>M (SD)</i>	Relaxation Post-intervention ² <i>M (SD)</i>	Control Pre-intervention ³ <i>M (SD)</i>	Control Post-intervention ³ <i>M (SD)</i>
MAAS ^a	50.55 (10.00)	52.82 (11.19)	50.90 (10.10)	53.56 (11.76)	51.30 (10.31)	54.35 (11.80)
FNE ^b	25.36 (2.50)	23.68 (5.52)	24.57 (2.80)	23.29 (5.20)	25.65 (2.56)	24.85 (5.54)
SADS ^c	17.09 (6.41)	13.59 (5.83)	15.90 (6.38)	13.62 (7.07)	17.60 (6.09)	16.80 (7.19)
Heart Rate	70.5 (9.92)	66.59 (11.09)	65.86 (11.40)	64.10 (11.61)	71.75 (11.25)	72.05 (12.45)
BP ^d systolic	119.09 (20.56)	115.14 (15.46)	121.10 (18.83)	113.90 (18.92)	120.00 (16.34)	116.15 (18.66)
BP ^d diastolic [†]	76.00 (8.89) [†]	75.55 (9.22)	76.29 (9.05) [†]	73.48 (11.10)	76.20 (7.79) [†]	74.50 (9.91)
RRQ - RM	49.33 (4.50)	43.14 (8.24)	48.38 (7.43)	45.38 (8.99)	49.90 (8.07)	47.70 (7.63)
WBSI ^f	56.49 (7.22)	52.32 (8.36)	56.24 (9.53)	53.48 (11.34)	58.90 (7.16)	58.75 (6.53)
TMMS-A ^g	49.27 (8.41)	47.41 (9.63)	50.76 (6.10)	49.58 (5.37)	52.13 (5.92)	52.10 (5.10)
TMMS-C ^h	31.86 (4.53)	33.86 (5.38)	31.13 (7.14)	32.29 (7.38)	33.20 (6.10)	33.30 (5.86)
TMMS-R ⁱ	20.41 (4.79)	21.18 (5.39)	19.71 (5.12)	20.24 (5.37)	19.60 (4.76)	20.20 (4.88)

¹n = 22. ²n = 21. ³n = 20. ^aMindful Attention Awareness Scale. ^bFear of Negative Evaluation Survey. ^cSocial Avoidance and Distress Scale. ^dBlood Pressure. ^eRumination Reflection Questionnaire – rumination subscale. ^fWhite Bear Suppression Inventory. ^{g-i}Trait Meta-Mood Scale. ^gAttention. ^hClarity. ⁱRepair. [†]Truncated data reported

Table 7

Pre and Post-intervention Means and Standard Deviations for the Self Compassion Scale and Subscales

	Mindfulness Pre-intervention ¹ M (SD)	Mindfulness Post-intervention ¹ M (SD)	Relaxation Pre-intervention ² M (SD)	Relaxation Post-intervention ² M (SD)	Control Pre-intervention ³ M (SD)	Control Post-intervention ³ M (SD)
Self-Kindness subscale	14.18 (3.42)	14.94 (3.66)	14.86 (3.53)	16.29 (4.18)	15.00 (3.65)	15.40 (5.05)
Self-Judgement subscale	17.86 (3.04)	17.00 (4.39)	18.19 (2.70)	17.19 (3.72)	17.15 (3.62)	18.15 (4.41)
Common Humanity subscale	11.86 (3.30)	13.18 (3.67)	12.14 (3.99)	13.38 (3.47)	12.10 (3.39)	11.45 (3.64)
Isolation subscale	14.68 (2.46)	12.41 (3.17)	14.48 (3.14)	14.48 (2.56)	14.85 (3.13)	15.75 (3.46)
Mindfulness subscale	12.45 (2.11)	13.09 (2.94)	12.81 (2.86)	14.05 (3.61)	13.90 (2.38)	12.45 (3.03)
Over-Identification	14.45 (2.94)	12.91 (3.72)	14.48 (2.66)	13.71 (3.74)	15.55 (3.19)	15.50 (2.86)
Total scale score	69.50 (10.27)	76.90 (15.61)	70.67 (12.56)	76.33 (16.62)	71.45 (14.49)	67.90 (17.19)

¹n = 22. ²n = 21. ³n = 20.

Table 8

Bivariate Correlations Between Baseline Scores for; Mindful Attention Awareness Scale, Fear of Negative Evaluation Scale, Social Avoidance and Distress Scale, Heart Rate and Blood Pressure, Rumination Subscale of Rumination Reflection Questionnaire, White Bear Suppression Inventory, and Trait Meta-mood Scale

Variables	1	2	3	4	5	6	7	8	9	10	11
1. MAAS ^a	-	-.261	-.273	-.155	-.151	-.021	-.210	-.218	.158	.393**	.325**
2. FNE ^b		-	.282*	.299*	-.027	-.073	.435**	.392**	.051	-.376**	-.219
3. SADS ^c			-	.196	-.009	.120	.229	.261*	-.207	-.307	-.483
4. Heart Rate				-	.122	.162	.340**	.207	-.151	-.042	-.162
5. BP ^d systolic					-	.771*	-.072	-.160	.063	.055	.149
6. BP ^d diastolic						-	-.159	-.164	.063	.015	.181
7. RRQ-RM ^e							-	.580**	.183	-.454**	-.415**
8. WBSI ^f								-	.176	-.240	-.190
9. TMMS-A ^g									-	.220	.280*
10. TMMS-C ^h										-	.463**
11. TMMS-R ⁱ											-

** $p < .01$ * $p < .05$ (2 tailed). $N = 63$ ^aMindful Attention Awareness Scale. ^bFear of Negative Evaluation Survey. ^cSocial Avoidance and Distress Scale. ^dBlood Pressure. ^eRumination Reflection Questionnaire – rumination subscale. ^fWhite Bear Suppression Inventory. ^{g-i}Trait Meta-Mood Scale. ^gAttention. ^hClarity. ⁱRepair
[†]truncated data reported

Table 9

Bivariate Correlations Between Baseline Scores for; Mindful Attention Awareness Scale, Fear of Negative Evaluation Scale, Social Avoidance and Distress Scale, Heart Rate and Blood Pressure, Rumination Reflection Questionnaire, White Bear Suppression Inventory, and Trait Meta Mood Scale, with the Self-compassion scale and Subscales

Variables	SCS-SK	SCS-SJ	SCS-CH	SCS-IS	SCS-MF	SCS-OI	SCS-Total
1. MAAS ^a	.145	-.110	.249*	.051	.124	-.061	.168
2. FNE ^b	-.330**	.182	-.391**	.223	-.107	.337**	-.405**
3. SADS ^c	-.187	.197	-.031	-.055	-.004	.039	-.109
4. Heart Rate	-.161	.277*	-.230	.121	-.165	.083	-.263*
5. BP ^d systolic	.147	-.203	-.133	-.028	.043	.092	.048
6. BP ^d diastolic	.011	.028	.035	.049	.002	.138	-.038
7. RRQ-RM ^e	-.489**	.447**	-.291*	.291*	-.256*	.515**	-.578**
8. WBSI ^f	-.344**	.183	-.049	.064	-.062	.241	-.243
9. TMMS-A ^g	.057	.115	.296*	-.043	.162	.368**	.027
10. TMMS-C ^h	.352**	-.319*	.222	-.207	.139	-.298*	.391**
11. TMMS-R ⁱ	.394**	-.270*	.462**	-.291*	.310*	-.170	.483

** $p < .01$ * $p < .05$ (2 tailed). $N = 63$ ^aMindful Attention Awareness Scale. ^bFear of Negative Evaluation Survey. ^cSocial Avoidance and Distress Scale. ^dBlood Pressure. ^eRumination Reflection Questionnaire – rumination subscale. ^fWhite Bear Suppression Inventory. ^{g-i}Trait Meta-Mood Scale. ^gAttention. ^hClarity. ⁱRepair.

Table 10

Bivariate Correlations Between Baseline Scores for the Self-Compassion Scale and Subscales

Variables	1	2	3	4	5	6	7
1. Self-Kindness subscale	-	-.553**	.407**	-.358**	.385**	-.450**	.808**
2. Self-Judgement subscale		-	-.131	.221	-.310*	.451**	-.669**
3. Common Humanity subscale			-	-.424**	.303*	-.170	.635**
4. Isolation subscale				-	-.207	.416**	-.653**
5. Mindfulness subscale					-	-.133	.557**
6. Over-Identification						-	-.652**
7. Total scale score							-

** $p < .01$ * $p < .05$ (2 tailed). $N = 63$

Changes in Mindfulness Over Time

Analyses were then conducted to compare pre and post-intervention mindfulness levels across conditions. Repeated measures ANOVA were conducted for both the MAAS and the mindfulness subscale of the SCS.

Mindful Attention Awareness Scale

Changes in mindful awareness to daily experiences across conditions were evaluated via repeated measures ANOVA for the MAAS. Means and standard deviations for the MAAS are presented in Table 5. There was a significant main effect of time for the MAAS; Wilks' Lambda = .90, $F(1, 60) = 6.49$, $p = .01$, $\eta_p^2 = .10$, indicating that overall participants across conditions reported greater awareness of daily experiences post-intervention. There was no significant interaction effect of Time X Group however; Wilks' Lambda = .99, $F(2, 60) = .05$, $p = .96$, $\eta_p^2 < .01$, suggesting that awareness of everyday experiences did not differ between groups.

Self-Compassion Scale - mindfulness subscale

Changes to mindfulness were further explored via repeated measures ANOVA for the mindfulness subscale of the SCS (see Figure 5). Means and standard deviations for this subscale are also presented in table 6. While there was no significant time effect across groups; Wilks' Lambda = .99, $F(1, 60) = .11$, $p = .74$, $\eta_p^2 < .01$, there was a significant Time X Group interaction effect; Wilks' Lambda = .90, $F(2, 60) = 3.53$, $p = .04$, $\eta_p^2 = .11$. Simple analyses revealed a significant difference in means for the mindfulness subscale post-intervention with control participants scoring significantly lower than either mindfulness; Wilks' Lambda = .88, $F(1, 41) = 4.53$, $p = .04$, $\eta_p^2 = .11$, or relaxation groups; Wilks' Lambda = .89, $F(1, 40) = 5.01$, $p = .03$, $\eta_p^2 = .12$. These results indicate that both relaxation and mindfulness condition participants presented with higher levels of mindful awareness of painful experiences post-intervention.

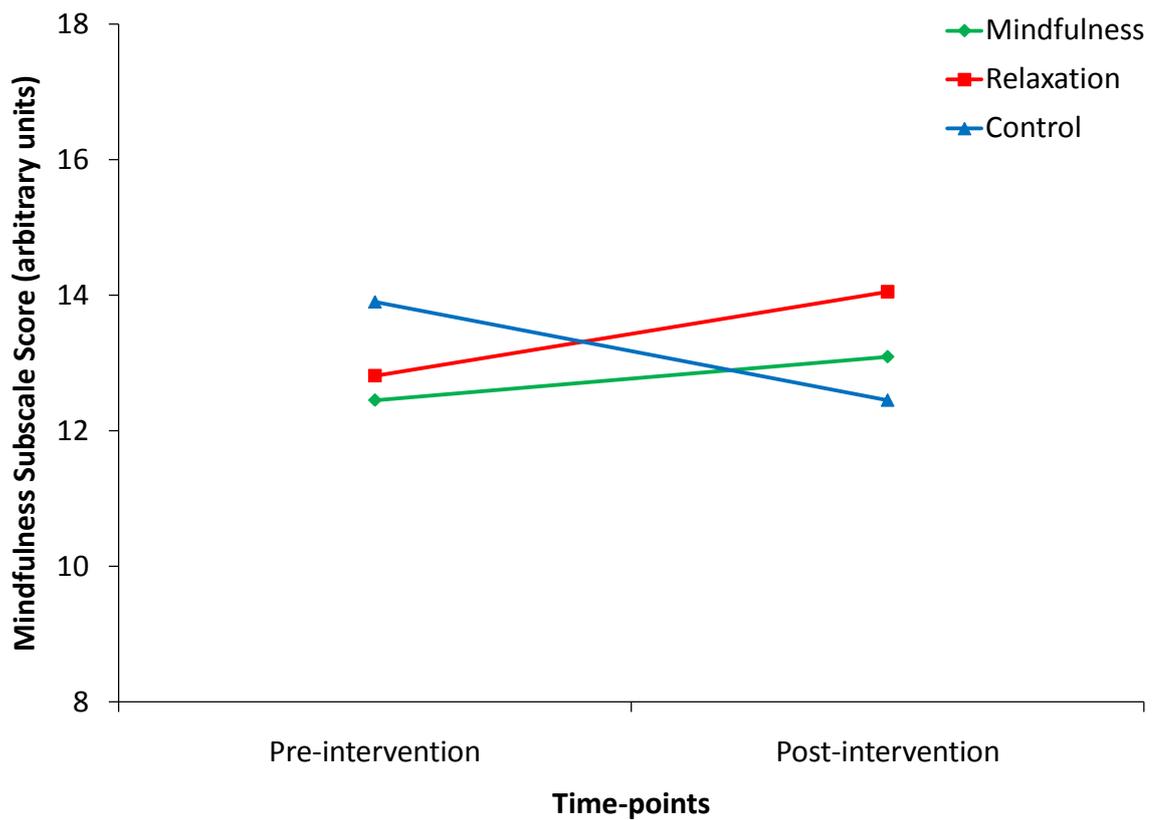


Figure 5: Pre and post-intervention mean scores of the Self-Compassion Scale mindfulness subscale (arbitrary units) for mindfulness, relaxation and control groups pre and post-intervention.

Changes in Anxiety Over Time

A series of repeated measures ANOVA were conducted to compare pre and post-intervention outcomes on anxiety measures (FNE, SADS, pre and post-intervention heart rate and blood pressure) for each group.

Fear of Negative Evaluation Survey

Means and Standard deviations for the FNE are presented in table 6. A repeated measures ANOVA on FNE scores indicated that there was a significant time effect; Wilks' Lambda = .93, $F(1, 60) = 4.48$, $p = .04$, $\eta_p^2 = .069$, indicating that overall FNE scores tended to decrease over time. However there was no significant Time X Group interaction effect, Wilks' Lambda = .99, $F(2, 60) = .18$, $p = .04$, $\eta_p^2 < .01$ suggesting there was no difference between the conditions in reducing fear of negative evaluation.

Social Avoidance and Distress Scale

Figure 6 illustrates mean scores for the SADS (arbitrary units) across each group pre and post-intervention. Means and standard deviations for the SADS are presented in table 6. A repeated measures ANOVA for SADS scores demonstrated a significant time effect; Wilks' Lambda = .75, $F(1, 60) = 19.66$, $p < .01$, $\eta_p^2 = .25$, indicating that overall participants across conditions reports less social avoidance and distress post-intervention. The Time X Group interaction effect approached significance; Wilks' Lambda = .92, $F(2, 60) = 2.48$, $p = .09$, $\eta_p^2 = .08$. This was followed up with simple effects analyses of Time X Group interaction effects for relaxation and control groups, and mindfulness and control groups. There was no significant Time X Group interaction for relaxation and control groups on the SADS; Wilks' Lambda = .96, $F(1, 39) = 1.38$, $p = .25$, $\eta_p^2 = .03$. However there was a significant Time X Group interaction effect for mindfulness and control groups, Wilks' Lambda = .85, $F(1, 40) = 6.84$, $p = .01$, $\eta_p^2 = .15$, suggesting a difference in the effectiveness of a mindfulness intervention in reducing social avoidance and distress as compared to control.

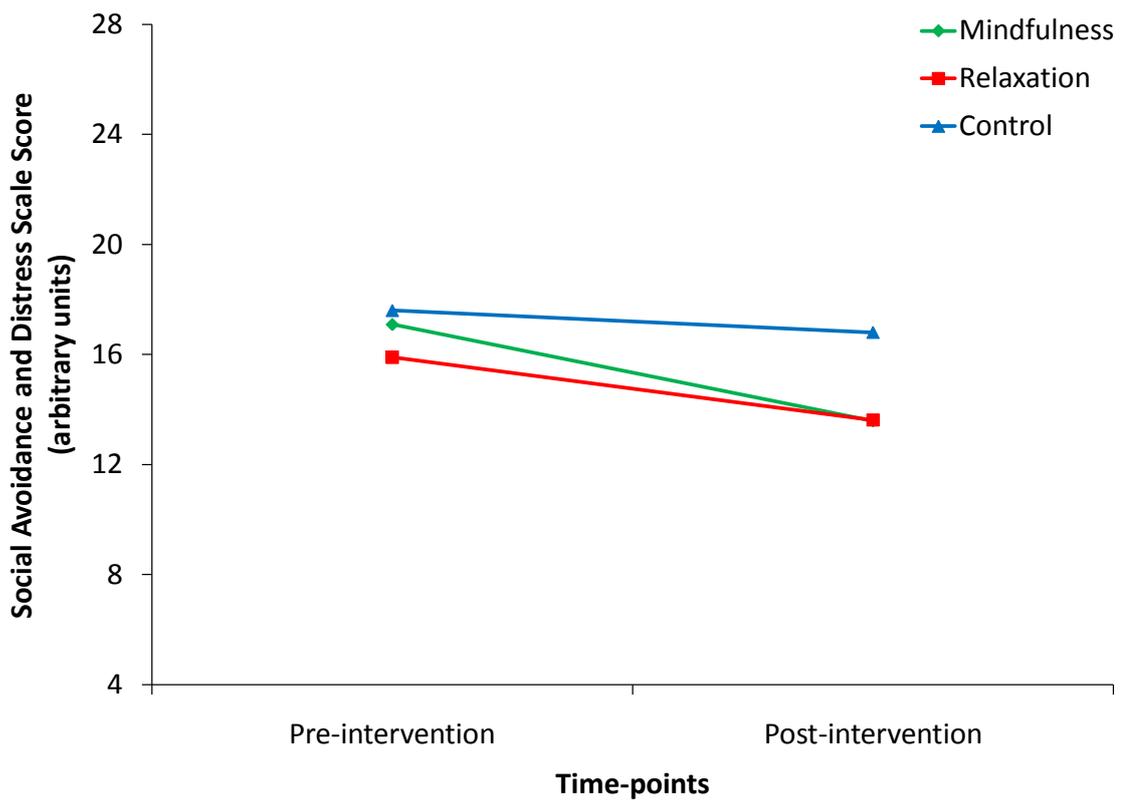


Figure 6: Mean scores of the Social Avoidance and Distress Scale (arbitrary units) for mindfulness, relaxation and control Groups pre and post-intervention.

Between Groups Comparisons of Anxiety Post Intervention

Analyses were then conducted to compare between groups differences on variables associated with anxiety during the speech task. A series of repeated measures ANOVA's were conducted for heart rate and blood pressure data collected in relation to the speech and anxiety symptom ratings prior to and during the speech for each group.

Heart Rate and Blood Pressure

Changes in anxiety were examined via a series of repeated measures ANOVA of heart rate and blood pressure data at four time-points in relation to the speech task; at baseline before participants were aware of the speech task, after announcement of a participant's speech turn, immediately after participants had practiced their technique or waited and after participants finished their speech. Heart rate and blood pressure means and standard deviations for participants in each condition are presented in table 11.

Table 11

Means and Standard deviations for Speech Heart Rate (HR) and Blood Pressure (BP)

	Mindfulness ¹	Relaxation ²	Control ³
	M (SD)	M (SD)	M (SD)
HR - baseline	66.59 (11.09)	64.10 (11.61)	72.05 (12.45)
BP systolic - baseline	115.14 (15.46)	113.90 (18.92)	116.15 (18.66)
BP diastolic - baseline	75.55 (9.22)	73.48 (11.10)	74.50 (9.91)
HR - announced	71.36 (13.22)	68.19 (12.58)	72.20 (9.85)
BP systolic - announced	127.09 (17.71)	123.71 (20.66)	121.60 (18.19)
BP diastolic - announced	85.73 (10.01)	78.95 (12.56)	79.25 (9.70)
HR - technique	73.55 (12.90)	71.29 (15.39)	75.45 (11.66)
BP systolic - technique	129.73 (16.11)	129.05 (21.46)	124.75 (15.84)
BP diastolic - technique	85.86 (10.07)	81.48 (12.10)	80.85 (8.89)
HR - finish	69.23 (12.10)	69.62 (13.87)	74.35 (13.68)
BP systolic - finish	125.64 (19.77)	125.62 (19.37)	124.45 (14.24)
BP diastolic - finish [†]	82.64 (10.06)	83.90 (11.64)	82.95 (9.83)

¹n = 22. ²n = 21. ³n = 20. [†]Truncated data reported

Heart Rate

A repeated measures ANOVA for heart rate demonstrated a significant effect of time; Wilks' Lambda = .58, $F(4, 57) = 10.24$, $p < .01$, $\eta_p^2 = .42$. This effect indicated that, overall, heart rate increased before the speech and decreased slightly afterwards. There was no significant Time X Group interaction effect for heart rate however; Wilks' Lambda = .87, $F(8, 114) = .97$, $p = .47$, $\eta_p^2 = .06$. Thus, there was no evidence that the groups differed in changes in heart rate before, during and after the speech task.

Blood Pressure

Repeated measures ANOVA revealed a significant main effect of time for both systolic; Wilks' Lambda = .46, $F(4, 57) = 16.95$, $p < .01$, $\eta_p^2 = .54$, and diastolic blood pressure; Wilks' Lambda = .40, $F(4, 57) = 21.44$, $p < .01$, $\eta_p^2 = .60$, indicating that overall blood pressure increased before the speech task and decreased slightly afterwards. There was no significant interaction effect of Time X Group for systolic blood pressure, Wilks' Lambda = .91, $F(8, 114) = .69$, $p < .69$, $\eta_p^2 = .05$.

A significant interaction effect was observed however for diastolic blood pressure; Wilks' Lambda = .75, $F(8, 114) = 2.18$, $p < .03$, $\eta_p^2 = .13$. Simple effects analyses revealed a significant difference at time point 2, where the participants turn to speak was announced. Mean levels of diastolic blood pressure were higher for mindfulness participants ($M = 85.73$) than for relaxation ($M = 78.95$) and control group participants ($M = 79.25$, $p < .01$). Figure 7 depicts mean levels of diastolic blood pressure (mm Hg) for each group across the four time points.

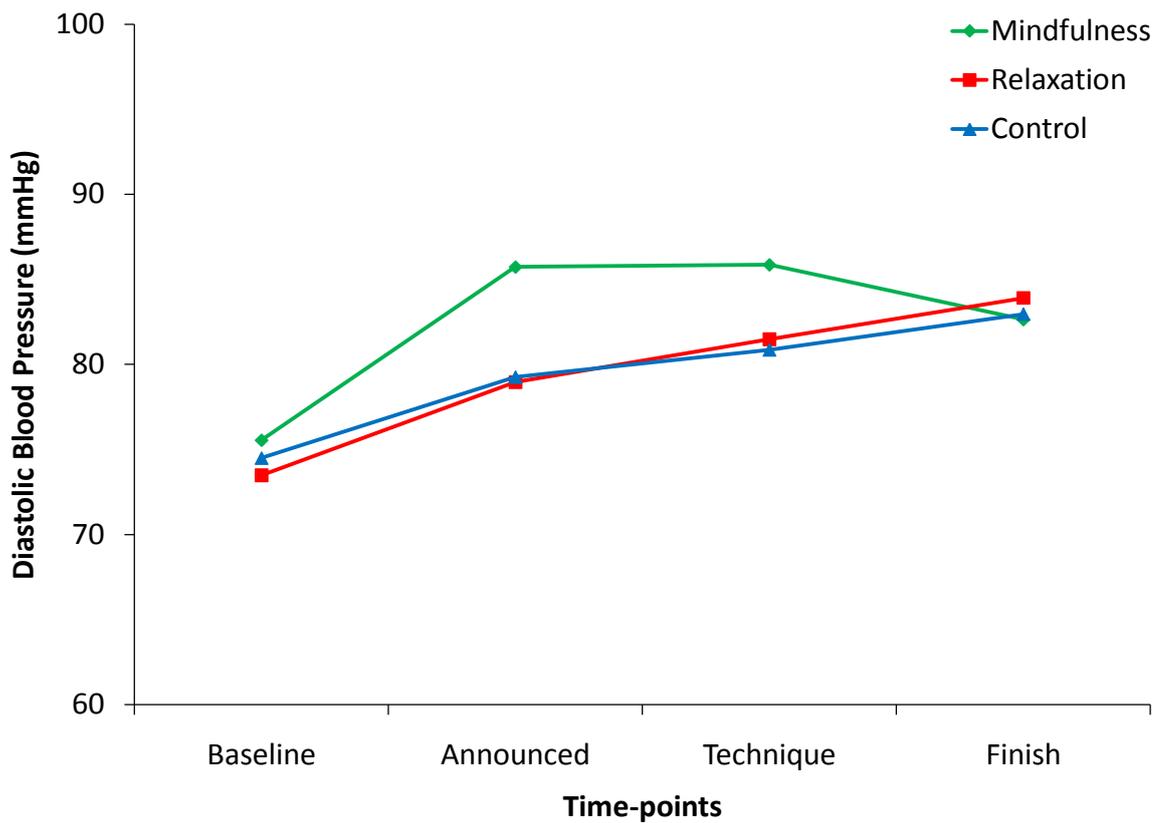


Figure 7: Mean levels of diastolic blood pressure (mmHg) for each group across the four time points.

Anxiety Symptom Ratings

Finally differences in post-intervention anxiety between groups were investigated via repeated measures ANOVA for self reported anxiety symptoms (ASR). Means and standard deviations for the ASR are presented in Table 12. There was a significant main effect of time; Wilks' Lambda = .527, $F(1, 59) = 53.06$, $p < .01$, $\eta_p^2 = .47$, indicating that there was an overall increase in ASR scores from baseline to the speech providing further support that the speech task increased anxiety as intended. There was no significant interaction effect of Time X Group; Wilks' Lambda = .99, $F(2, 59) = .292$, $p = .75$, $\eta_p^2 = .01$, indicating that there was no difference between conditions in self-reported anxiety symptoms during the speech.

Table 12

Means and Standard Deviations for Speech Measures; Anxiety Symptom Ratings, Self-Statements During Public Speaking Scale and Thought Conviction

	Mindfulness ¹	Relaxation ²	Control ³
	M (SD)	M (SD)	M (SD)
ASR ^a - Baseline	10.32 (9.07)	8.52 (8.29)	9.50 (10.84)
ASR ^a - Speech	21.52 (10.85)	19.62 (11.69)	18.53 (9.22)
SSPS ^b - Positive	16.93 (5.07)	16.86 (4.40)	13.16 (5.27)
SSPS ^b - Negative	8.64 (5.9)	8.90 (5.91)	9.42 (6.45)
Thought Conviction	20.09 (5.26)	23.80 (5.11)	22.39 (4.22)

¹n = 22. ²n = 21. ³n = 20. ^aAnxiety Symptom Ratings. ^bSelf-Statements During Public Speaking Scale

Changes to Potential Mechanisms Post-Intervention

Analyses were then conducted to investigate post-intervention changes to measures of the mechanisms hypothesised to change with mindfulness training; attention, decentering, emotion regulation, behavioural regulation and self-compassion.

Attention

In addition to information about attention provided by the MAAS and SCS mindfulness subscale, post-intervention changes to attention were further assessed via a series of repeated measures ANOVA for the RRQ, the over-identification subscale of the SCS, the WBSI and the attention subscale of the TMMS. Pre and post-intervention means and standard deviations for these measures are presented in tables 6 and 7. Changes to attention were also assessed via repeated measures ANOVA of the Stroop where the repeated measures were target and control word latencies for each condition (social threat, physical threat and control). Latency means and standard deviations for each condition of the Stroop are presented in Table 13.

Table 13

Means and Standard Deviations of Colour Naming Latencies in Seconds for Stroop Conditions

Condition	Target words	Control words
	<i>M (SD)</i>	<i>M (SD)</i>
Colour names		
Mindfulness ¹	109.69 (20.62)	67.68 (10.84)
Relaxation ²	117.71 (28.81)	72.76 (10.80)
Control ³	109.48 (28.21)	72.56 (20.90)
Social Threat words		
Mindfulness ¹	84.44 (15.62)	77.57 (12.34)
Relaxation ²	87.71 (16.61)	82.70 (16.03)
Control ³	82.49 (17.51)	79.45 (18.52)
Physical Threat words		
Mindfulness ¹	83.25 (16.73)	78.35 (14.63)
Relaxation ²	84.60 (15.16)	82.50 (12.88)
Control ³	83.27 (21.12)	80.67(19.12)

¹*n* = 22. ²*n* = 21. ³*n* = 20.

Rumination Reflection Questionnaire – rumination subscale

Changes to over-engagement of attention post intervention were explored via repeated measures ANOVA for the RRQ rumination subscale. There was a significant main effect of time on this subscale; Wilks' Lambda = .71, $F(1, 59) = 23.93$, $p < .01$ $\eta_p^2 = .29$, indicating that overall rumination decreased across conditions. Although there was no significant interaction effect of Time x Group on the rumination subscale; Wilks' Lambda = .93, $F(2, 59) = 2.34$, $p = .10$ $\eta_p^2 = .07$, simple effects analyses revealed a significant Time x Group

interaction effect for mindfulness and control group participants; Wilks' Lambda = .90, $F(1, 39) = 4.54$, $p = .04$, $\eta_p^2 = .10$, that was not evident for relaxation and control groups; Wilks' Lambda = .99, $F(1, 39) = 2.34$, $p = .65$, $\eta_p^2 < .01$. Figure 8 depicts mean scores on the rumination subscale (arbitrary units) for each group pre and post intervention.

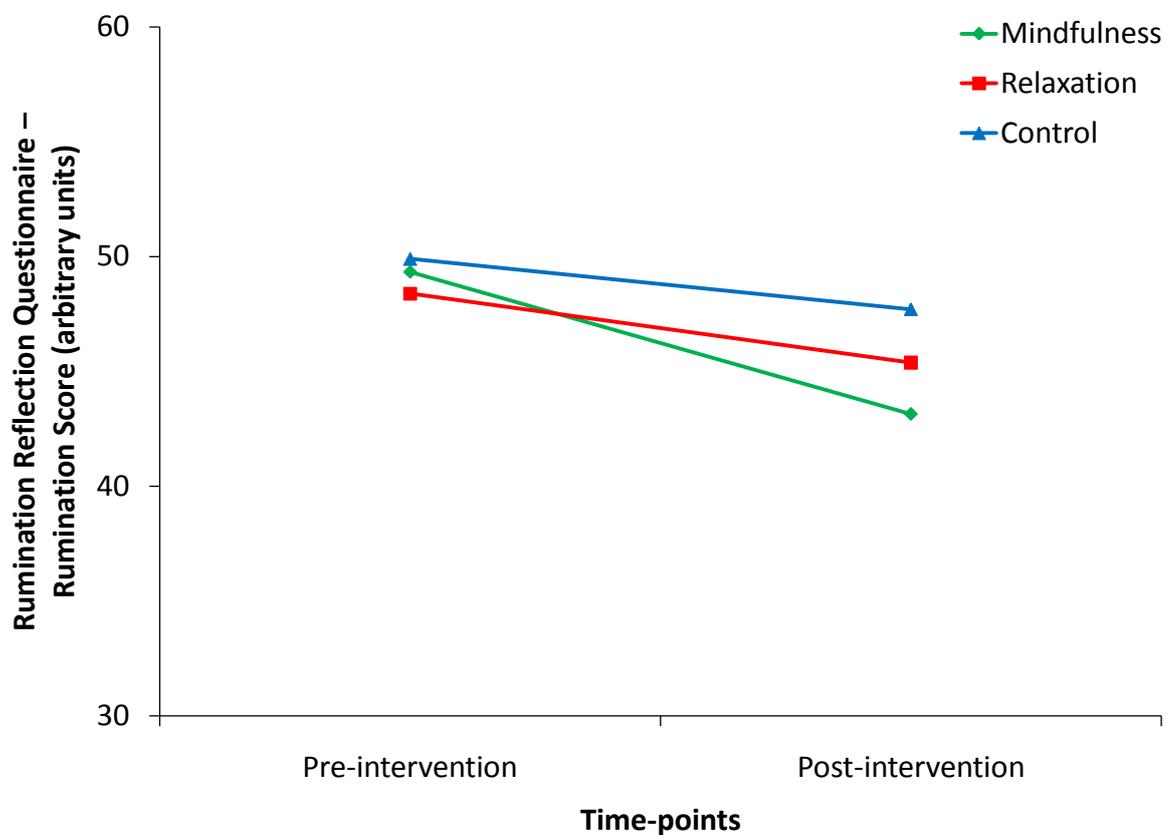


Figure 8: Mean scores for the rumination subscale of the Ruminant Reflection Questionnaire (arbitrary units) for each group pre and post intervention.

SCS over-identification subscale

Changes to over-engagement of attention were further explored via repeated measures ANOVA of scores on the over-identification subscale of the SCS pre and post-intervention. There was no significant effect of time; Wilks' Lambda = .96, $F(1, 60) = 2.78$, $p = .10$, $\eta_p^2 = .04$, indicating that overall there was no change in over-identification with painful experiences post-intervention. There was no significant interaction effect of Time x Group either; Wilks' Lambda = .97, $F(2, 60) = .84$, $p = .44$, $\eta_p^2 = .03$, suggesting that there was no difference in over-identification processes between conditions.

White Bear Suppression Inventory

Changes to under-engagement of attention were investigated via repeated measures ANOVA for the WBSI. There was a significant time effect, Wilks' Lambda = .91, $F(1, 60) = 5.72$, $p = .02$, $\eta_p^2 = .09$, indicating that overall thought suppression reduced across conditions. There was no significant Time X Group interaction effect, Wilks' Lambda = .96, $F(2, 60) = 1.41$, $p = .25$, $\eta_p^2 = .05$, indicating that neither intervention had any specific effect on thought suppression.

TMMS attention subscale

Changes to attention to emotion were investigated via repeated measures ANOVA for the attention subscale of the TMMS. This ANOVA revealed no significant effect for time, Wilks' Lambda = .95, $F(1, 60) = 3.34$, $p = .07$, $\eta_p^2 = .05$, and no significant interaction effect of Time X Group; Wilks' Lambda = .97, $F(2, 60) = .90$, $p = .41$, $\eta_p^2 = .03$, indicating that there was no change in attention to emotions post-intervention across all conditions.

Stroop Data

Over-engagement of attention was also investigated via repeated measures ANOVA of Stroop latencies. There was a significant main effect for each condition indicating that overall participants were slower at naming target words than control words; social threat condition, Wilks' Lambda = .77, $F(1, 58) = 17.33$, $p < .01$, $\eta_p^2 = .23$, physical threat condition, Wilks' Lambda = .87, $F(1, 58) = 8.30$, $p < .01$, $\eta_p^2 = .13$, and control condition; Wilks' Lambda = .21, $F(1, 58) = 215.42$, $p < .01$, $\eta_p^2 = .13$. There was no significant interaction effect however of Group x Condition; social threat condition, Wilks' Lambda = .97, $F(2, 58) = .86$, $p = .43$, $\eta_p^2 = .03$, physical threat condition, Wilks' Lambda = .98, $F(2, 58) = .63$, $p = .54$, $\eta_p^2 = .02$, and control condition Wilks' Lambda = .99, $F(2, 58) = .31$, $p = .74$, $\eta_p^2 = .04$. These results indicate that there was no difference in hypervigilance for threat across mindfulness, relaxation and control groups post-intervention.

Decentering

Post- intervention differences on decentering were assessed via a one way ANOVA comparing total ratings of thought conviction during the speech across conditions. The difference in thought conviction approached significance for the three conditions $F(2, 57) = .3.06$, $p = .055$, $\eta_p^2 = .09$. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for mindfulness groups ($M = 20.09$, $SD = 5.26$) was significantly lower than relaxation groups ($M = 23.80$, $SD = 5.26$), indicating lower levels of thought conviction for mindfulness participants. Control groups ($M = 22.02$, $SD = 5.09$) did not differ from either mindfulness or relaxation groups.

Emotion and Behavioural Regulation

While the mindfulness and over-identification subscales of the SCS provide information about mindful awareness of painful emotions and over-identification with emotional distress,

other changes in emotion regulation were assessed via repeated measures ANOVA for the TMMS and SSPS. Results of SADS analyses were also considered.

Trait Meta Mood Scale

Means and standard deviations for the attention, clarity and repair subscales of the TMMS are presented in table 6. There was no significant main effect for any of the subscales of the TMMS; attention, Wilks' Lambda = .95, $F(1, 60) = 3.34$, $p = .07$, $\eta_p^2 = .05$, clarity Wilks' Lambda = .94, $F(1, 60) = 3.81$, $p = .06$, $\eta_p^2 = .06$, or repair, Wilks' Lambda = .97, $F(1, 60) = 1.82$, $p = .18$, $\eta_p^2 = .03$. There was no significant interaction effect of Time X Group either for any of the subscales; attention, Wilks' Lambda = .97, $F(2, 60) = .90$, $p = .41$, $\eta_p^2 = .03$, clarity Wilks' Lambda = .97, $F(2, 60) = .98$, $p = .38$, $\eta_p^2 = .03$, or repair, Wilks' Lambda = .99, $F(2, 60) = .03$, $p = .97$, $\eta_p^2 < .01$. These results suggest that there was no difference between conditions on attention to emotions, ability to discriminate emotions and ability to repair negative mood states.

Self Statements During Public Speaking Scale

Emotion Regulation was further explored via a one way ANOVA of positive and negative self-statements as measured by the Self Statements During Public Speaking scale. Means and standard deviations for the positive and negative subscales of the SSPS are presented in table 12. There was a statistically significant difference in SSPS positive subscale score between the conditions, $F(2, 59) = 3.81$, $p = .03$, $\eta_p^2 = .01$. Post-hoc comparisons were conducted using the Tukey HSD test. These indicated that participants in the mindfulness group endorsed significantly more positive self statements ($M = 16.93$, $SD = 5.07$) relative to participants in the control group ($M = 13.16$, $SD = 5.27$). Mean scores for the relaxation group ($M = 16.85$, $SD = 4.40$) did not differ significantly from either those of mindfulness group or control group. There was no statistically significant difference between conditions for the negative self statements subscale, $F(2, 59) = .09$, $p = .92$.

Social Avoidance and Distress Scale

Behavioural and emotional regulation was also investigated via results of the repeated measures ANOVA for the SADS. This scale measures both avoidance of and distress in social situations. The results of these analyses as described on page 110 suggest that mindfulness participants may have presented with less distress and avoidance of social situations than control participants post-intervention.

Self Compassion

In addition to data obtained from the SCS mindfulness and over identification subscales changes in self compassion were further assessed via repeated measures ANOVA for the remaining SCS subscales and total scale score. Means and standard deviations for these are presented in table 7. A significant time effect was found for the common humanity subscale, suggesting that overall scores increased post-intervention for this measure. There was no significant Time X Group interaction effect for this subscale however and no significant time effects on any other subscale or the total scale score.

In addition to the significant Time X Group interaction effect identified for the mindfulness subscale, Time X Group interaction effects were also found for the isolation subscale, and total scale scores. Simple effects analyses revealed a significant difference in scores for the isolation subscale post intervention ($p = .03$) for mindfulness groups as compared to relaxation, Wilks' Lambda = .90, $F(1, 41) = 4.53$, $p = .04$, $\eta_p^2 = .10$, and control participants Wilks' Lambda = .87, $F(1, 40) = 5.75$, $p = .02$, $\eta_p^2 = .13$. Specifically isolation scores for mindfulness participants were significantly lower than for the other two conditions. Figure 9 illustrates mean scores for the isolation subscale for each group pre and post-intervention.

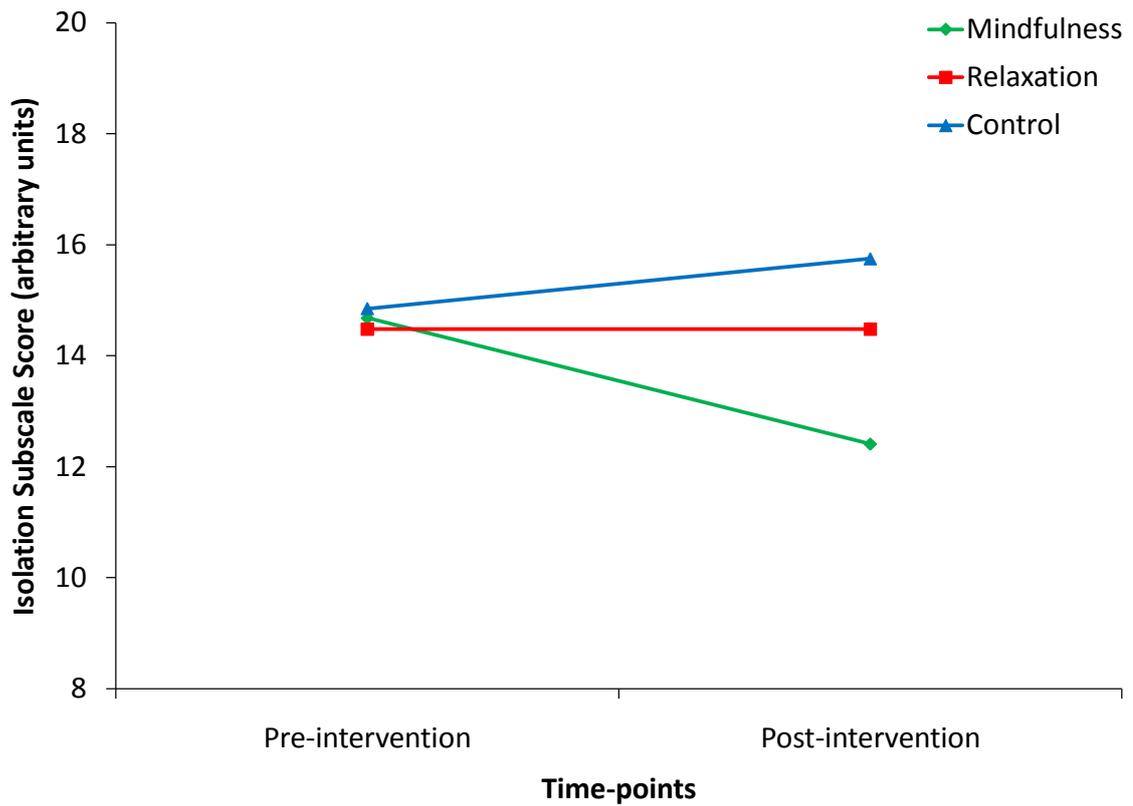


Figure 9: Mean scores for the Isolation subscale of the Self-Compassion Scale (arbitrary units) for each group pre and post intervention.

Simple effects analyses also revealed a significant difference in total scale scores post-intervention with control participants scoring significantly lower than mindfulness participants; Wilks' Lambda = .88, $F(1, 40) = 5.47$, $p = .02$, $\eta_p^2 = .12$, or relaxation participants Wilks' Lambda = .87, $F(1, 39) = 5.66$, $p = .02$, $\eta_p^2 = .13$. Figure 9 illustrates mean SCS total scores for each group pre and post-intervention. There were no significant interaction effects on any of the other subscales.

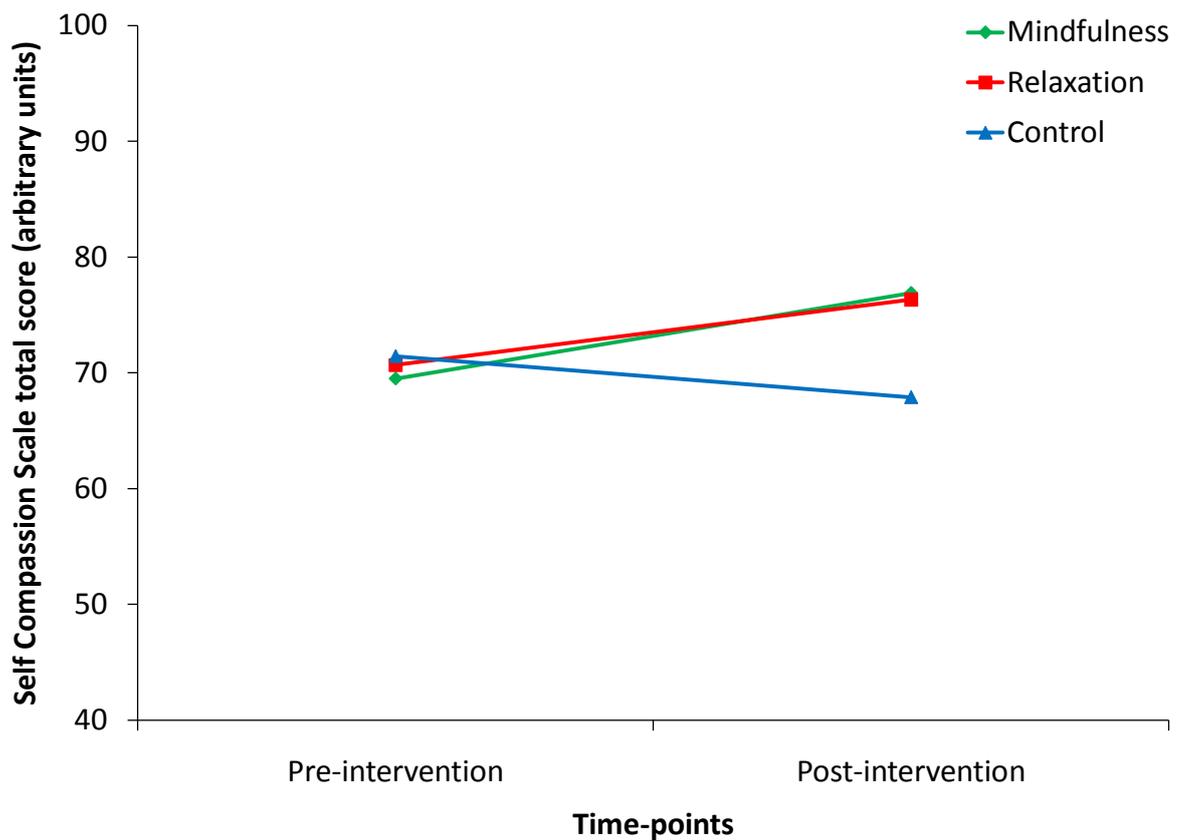


Figure 10: Mean total scores for the Self Compassion Scale (arbitrary units) for each group pre and post intervention.

Effectiveness and Acceptability of the Interventions

Finally, analyses were conducted to explore the perceived effectiveness and acceptability of the interventions for Mindfulness and Relaxation condition participants. An independent samples t-test was conducted to compare ratings by relaxation and mindfulness participants of the perceived effectiveness of each intervention in helping participants manage the speech task as well as their evaluations of the technique. Means and standard deviations for these measures are presented in table 14 along with percentages of participants in each condition who agreed with effectiveness and evaluation questionnaire statements. There were no significant differences between ratings of perceived effectiveness for mindfulness and relaxation group participants and no significant differences in ratings of each technique

suggesting that both groups found the interventions to be comparably acceptable and effective.

Table 14

Means and Standard Deviations for Effectiveness and Evaluation Ratings as well as Percentages of Participants who Agreed with Effectiveness and Evaluation Statements

	<u>Mindfulness¹</u>		<u>Relaxation²</u>	
	M (SD)	Agree ^a (%)	M (SD)	Agree ^a (%)
Effectiveness				
Less anxious while waiting	6.59 (2.38)	77.30	5.57 (2.09)	57.10
Less anxious while speaking	5.55 (2.79)	54.50	4.43 (2.09)	33.40
Perform better	5.27 (3.00)	45.40	4.05 (2.25)	23.90
Total	17.41 (7.19)	-	14.05 (5.30)	-
Evaluation				
Enjoyable	3.95 (8.44)	72.80	3.90 (.94)	85.70
Understandable	4.55 (.51)	100.00	4.57 (.87)	85.70
CD and handbook useful	4.45 (.59)	95.50	4.62 (.50)	100.00
Helped manage anxiety	3.50 (.92)	59.10	3.29 (1.01)	42.80
Will continue practicing	3.73 (1.03)	59.10	3.76 (1.14)	80.90
Recommend to others	4.05 (.79)	81.80	3.76 (1.04)	76.10
Total	24.23 (3.75)	-	23.90 (4.18)	-

¹n = 22. ²n = 21. ^a Percentage of participants who agreed or strongly agreed with statements of effectiveness and evaluation (Effectiveness rating >5. Evaluation ratings > 3) - Total scores are not included as these incorporate all individual ratings

Summary

A summary of the outcomes is presented in table 15. The RCT demonstrated that although mindfulness training did not influence mindful awareness of daily experiences, both mindfulness and relaxation training were associated with higher levels of mindful awareness of painful experiences. In addition, although the mindfulness intervention did not influence fears of negative evaluation, awareness of anxiety symptoms, heart rate or systolic blood pressure associated with social anxiety, it may have influenced other aspects of anxiety, including social avoidance and distress and diastolic blood pressure. For measures of potential mindfulness mechanisms, there was mixed evidence of an influence of the mindfulness intervention. Although mindfulness training may have influenced rumination, there was no evidence of any influence on over-identification with painful experiences, thought suppression, or hypervigilance for social threat. The RCT did demonstrate an influence of mindfulness training on decentering as measured by ratings of thought conviction. There was also mixed evidence of an influence on behavioural and emotional regulation. While there was no evidence of an influence of mindfulness training on attention to emotions, clarity about emotions or capacity to repair negative mood states the results suggested that the intervention may have reduced distress and avoidance associated with social anxiety and that mindfulness participants managed a stressful situation by using more positive self statements than other groups. There was also mixed evidence regarding the influence of the intervention on self compassion. Both mindfulness and relaxation interventions were associated with greater mindful awareness of painful experiences post-intervention and overall increases in self compassion. The mindfulness intervention was uniquely associated with decreases in perceived isolation from others when experiencing painful emotions. Finally, these results suggest that brief mindfulness training is perceived by participants as an effective and acceptable intervention.

Table 15
Summary of Outcomes from Study Phase 4

Variable	Construct	Outcome
Mindfulness		
MAAS ^a	Mindful awareness of daily experiences	Significant increases across conditions
SCS-MF	Mindful awareness of painful experiences	Post-intervention control groups score significantly lower than mindfulness or relaxation groups
Social Anxiety		
FNE ^b	Fear of negative evaluation	Significant decreases across conditions
SADS ^c	Social avoidance and distress	Significant decreases across conditions *Mindfulness groups score lower than control groups post-intervention
Heart Rate and BP ^d	Cardiovascular reactivity	Significant increases across conditions in response to the speech task Mindfulness participants demonstrated significantly higher diastolic blood pressure on announcement of their speech turn relative to other groups
ASR	Anxiety symptoms	Significant increases across conditions in response to the speech task
Attention		
MAAS _a	Attention to daily experiences	Significant increases across conditions
SCS ^{MF}	Balanced attention to painful experiences	Post-intervention control groups score significantly lower than mindfulness or relaxation groups
TMMS-A ^g	Attention to emotions	No significant differences
RRQ-RM ^e	Over-engagement of attention to thoughts	Significant decreases across conditions *Mindfulness participants score lower than control groups post-intervention
SCS-OI	Over-engagement of attention to painful experiences	No significant differences
Stroop task	Over-engagement of attention to social threat cues	Significant increases in response times to threat stimuli across conditions
WBSI ^f	Under-engagement of attention to thoughts	Significant decreases across conditions

Variable	Construct	Outcome
Decentering		
Thought conviction	Extent to which thoughts during speech are thought to reflect reality	Mindfulness groups score significantly lower than relaxation groups.
Emotion/Behavioural Regulation		
TMMS ^h	Emotional intelligence. Attention to emotions, clarity about emotions and ability to repair negative moods	No significant differences
SSPS-P ⁱ	Positive self-statements during speech	Mindfulness groups score significantly higher than controls
SSPS-N ^j	Negative self-statements during speech	No significant differences
SADS ^c	Social avoidance and distress	Significant decreases across conditions *Mindfulness groups score lower than groups post-intervention
Self-compassion		
SCS-SK ^k	Self-kindness during distress	No significant differences
SCS-SJ ^l	Self-judgement during distress	No significant differences
SCS-CH ^m	Perceiving flaws and inadequacies as universal	Significant increases across groups
SCS-CH ⁿ	Feeling isolated in suffering	Mindfulness groups score significantly lower than relaxation or control groups post-intervention
SCS-MF ^o	Mindful awareness of painful experiences	Post-intervention control groups score significantly lower than mindfulness or relaxation groups
SCS-OI ^p	Over-engagement with painful experiences	No significant differences
SCS-total ^q	Overall self-compassion	Mindfulness and relaxation groups score significantly higher than control groups

*Based on non-significant trend data - should be interpreted with caution. ^aMindful Attention Awareness Scale. ^bFear of Negative Evaluation Survey. ^cSocial Avoidance and Distress Scale. ^dBlood Pressure. ^eRumination Reflection Questionnaire – rumination subscale. ^fWhite Bear Suppression Inventory. ^gTrait Meta-Mood Scale – attention subscale. ^hTrait Meta-Mood Scale. ^{i-j}Self-Statements during Public Speaking Scale. ⁱpositive. ^jnegative. ^{k-q}Self Compassion Scale. ^kself-kindness. ^lself-judgement. ^mcommon humanity. ⁿisolation. ^omindfulness. ^pover-identification.

CHAPTER 12

DISCUSSION

This study represents the first investigation of brief mindfulness training for social anxiety. The main purpose of this study was to investigate the efficacy of a brief mindfulness intervention in reducing experiences of social anxiety and to explore the mechanisms underlying any effect. The randomization process used in this study phase 4 was successful at ensuring there were no significant differences in scale scores or demographic characteristics between the mindfulness, relaxation and control groups prior to the intervention. As a result the effects observed are likely to be attributable to the intervention.

Changes to Mindfulness

The increase in mindfulness scores across conditions suggests that overall, participants increased in trait mindfulness regardless of whether they received an intervention or not. There was no evidence that mindfulness training per se led to an increase in trait mindfulness for this group. The MAAS measures trait mindfulness in daily life rather than the capacity to enter a mindful 'state'. It may be that the duration of the intervention was too brief for mindfulness skills to be generalized to daily experience.

Although there was no difference in trait mindfulness between conditions, compared to control groups both mindfulness and relaxation condition participants demonstrated a post-intervention increase in mindfulness as measured by the SCS. The emphasis of this scale on balanced awareness of emotional states and experiences suggests that this measure may access emotion regulation aspects of mindfulness, specifically the tendency not to over-identify, or over-engage with painful experiences. Indeed the scale's author intended this subscale to provide a counter to the SCS over-identification subscale (Neff, 2003a). Over-identification strategies such as

rumination may be utilised as an emotion-regulation strategy in the absence of effective alternatives (Nolen-Hoeksema et al., 2008). If relaxation and mindfulness training provided participants with an alternative means of managing their emotional experience this may have led to decreases in the use of over-identification as a regulation strategy and resulted in increases in balanced (mindful) awareness of distress. The absence of any difference between conditions on the over-identification subscale however does not support this.

Furthermore, although mindfulness and relaxation techniques differed in their intended outcomes (i.e., relaxation versus awareness) both techniques shared similarities as well. Participants in the relaxation condition were encouraged to focus their attention on muscle groups as they tensed and relaxed them and therefore, as with the mindful breathing technique, practice involved managing the focus and direction of their attention. Similarly, by taking time each day to practice a technique both groups were deliberately attending to a task for 15 minutes and as such were engaged in a degree of present centred awareness, in so far as it was not possible to attend to other aspects of experience simultaneously. It may be that changes in mindfulness observed for relaxation participants relate to elements of attention training that occurred as part of the relaxation exercise.

Overall the results of this study do not support the hypothesis that a brief mindfulness intervention specifically leads to increases in trait mindfulness. They suggest, instead, that both mindfulness and relaxation training may be associated with greater mindful awareness of painful experiences. Changes in mindfulness were observed across conditions, suggesting that there may be some other unidentified universal factor that alters mindful awareness of everyday experiences over time.

Changes to Social Anxiety

The purpose of the study was to investigate whether mindfulness was an effective intervention in reducing experiences of social anxiety. Participants across conditions demonstrated reductions on both fear of negative evaluation by others and social avoidance and distress. While there was no difference between the conditions on fear of negative evaluation post-intervention mindfulness participants reported significantly lower levels of social avoidance and distress than control groups post intervention. This suggests that, as compared to no intervention, mindfulness training may lead to a significant reduction in social avoidance and distress associated with social anxiety. While the SADS tends to measure more emotional and behavioural aspects of social anxiety (e.g., 'Being introduced to people makes me tense and nervous' and 'I try to avoid talking to people unless I know them well') the FNE measures more cognitive aspects (e.g., 'If someone is evaluating me I tend to expect the worst'). The different pattern of results observed across these two measures of social anxiety therefore may reflect changes to different aspects of anxiety. This is consistent with other literature indicating that the FNE and SADS assess distinct aspects of social anxiety (Oei, Kenna, & Evans, 1991). These results suggest that the mindfulness intervention may have resulted in less behavioural avoidance and emotional distress in social situations, but not generated any greater reduction in negative cognitions than other conditions. These findings should be interpreted with caution however as Time X Group effects for the SADS fell short of statistical significance.

The impact of the mindfulness intervention on anxiety more generally can also be explored via blood pressure and heart rate data. This data provides information on cardiovascular reactivity during the speech task. The results indicated that, across conditions, participants systolic and diastolic blood pressure and heart rates increased prior to the speech and then decreased slightly afterwards.

While there was no difference between conditions on heart rate or systolic blood pressure measures, a difference was detected for diastolic blood pressure, with mindfulness participants demonstrating a greater elevation of diastolic blood pressure than others upon announcement of their speech turn. Although previous studies have found associations between decreased diastolic blood pressure and both relaxation and mindfulness training (Ditto, Eclache, & Goldman, 2006; Kingston, Chadwick, Meron, & Skinner, 2007), increases in systolic and diastolic blood pressure been found in the context of perceived task difficulty (Gendolla, 1999; Gendolla & Richter, 2005) and social evaluative threat (Wright, Dill, Geen, & Anderson, 1998). There is also evidence of an interaction effect between task difficulty and socially relevant threat such that this increases cardiovascular reactivity, and therefore blood pressure, only when a task is perceived as subjectively difficult (Gendolla, 1999; Gendolla & Richter, 2005, 2006).

Experimental tasks such as speech preparation and presentation are typically thought to involve active coping (Sherwood, Dolan, & Light, 1990). Active coping occurs when individuals believe they can influence the outcome of an event through effort (Gendolla, 1999; Gramer & Saria, 2007). Increases in blood pressure during active coping are associated with higher levels of cardiac output and therefore usually occur in conjunction with increased heart rate (Sherwood et al., 1990). This contrasts with passive coping which occurs when individuals experience a stressful event for which they do not believe they can influence the outcome (e.g., a cold pressor test) (Sherwood et al., 1990). The use of vigilance to threat as a coping strategy has been associated with this pattern of activation suggesting that allocating attention to aversive events may be a form of passive coping (Ishida, 2006). Increases in blood pressure during passive coping have been associated primarily with vascular constriction and only moderate increases in cardiac output such that increases in heart rate may not be observed. In addition individuals who are more likely to engage in this coping style are more likely to present with increased diastolic blood pressure than others (Sherwood et al., 1990).

The peak in diastolic blood pressure observed for mindfulness participants occurred as their turn was announced, prior to their practicing mindfulness for 3 minutes before speaking. Whilst participants across all conditions are likely to have engaged in active coping in preparation for the speech, the peak observed for mindfulness participants may have arisen because mindful practice also captured elements of passive coping. For example, an attitude of acceptance might have reduced participants' perceived ability to influence outcomes. If participants adopted a stance of accepting their experience they may have been less inclined to engage in strategies to enhance their performance, increasing the likelihood of adopting a passive rather than an active coping stance. In addition, the focus on attentional resources during mindful practice might have temporarily influenced attention to threat stimuli. For example, as participants anticipated practicing mindful breathing they may have briefly observed breath sensations, increasing awareness of internal cues to anxiety and therefore vigilance for these. This increased vigilance may have further increased the likelihood of mindfulness groups adopting a passive coping style. The higher levels of diastolic blood pressure observed in this group may reflect engagement in this coping style.

Finally anxiety was also assessed via ratings of anxiety symptoms provided by participants before and after the speech task. There were no significant differences between groups on this measure though suggesting that the mindfulness intervention did not reduce anxiety symptoms. Notably though it also did not increase anxiety symptoms. One potential negative consequence of using a very brief mindfulness intervention with this population is that participants may, in the short term, engage in heightened self-focussed attention as a consequence of observing internal phenomena such as breathing. Hayes and Feldman (2004) note that while mindfulness may lead to a transient worsening of symptoms, for example through exposure to disturbing emotions, it may also support management of this experience by supporting individuals to not over-engage with distress. If participants in a brief intervention did not acquire skills of decentering and continued to over-engage with disturbing emotions then they may have experienced a worsening of symptoms as a result of heightened awareness to internal experience, without additional skills to manage this

related distress. For socially anxious participants an increase in self-focussed attention might lead to a worsening of social anxiety as per the cognitive model of social anxiety. The finding that there were no significant differences between groups suggests that this did not happen in the present study.

Overall these results suggest that mindfulness was at least as effective as relaxation in supporting participants to manage their anxiety and may have led to greater reductions in avoidance and distress. An increase in diastolic blood pressure for Mindfulness participants may reflect a passive coping stance. The implications of this are not known and require further investigation.

Changes to Potential Mechanisms of Mindfulness

Attention

Although the mindfulness intervention did not appear to have a specific effect on mindful attention to daily experiences, both mindfulness and relaxation interventions may have led to more balanced awareness of painful experiences. Interestingly the results of this study suggest there was no specific effect on attention to emotional states as measured by the TMMS. Items of the TMMS attention subscale measure the extent to which the individual either does, or does not, attend to their emotional experiences. This differs subtly from the SCS mindfulness subscale which measures the tendency to attend to painful experiences in a balanced way. Therefore it may be that while there was no change to overall attention to emotions, where an emotion was attended to, this was done so with balance. This might capture an attitude associated with attending, or a style of attending rather than straightforward attention per se.

In addition there is evidence that the mindfulness intervention may have led reductions in rumination. This supports findings from other studies that mindfulness-based interventions lead to reductions in rumination (Jain et al., 2007; Ramel et al.,

2004) and suggests mindfulness may lead to a reduction in over-engagement of attention. Notably the same pattern was not observed for the over-identification subscale of the SCS. Whereas items of the RRQ refer to cognitive aspects of rumination (e.g., ‘Often I’m playing back over in my mind how I acted in a past situation’ and ‘Sometimes it is hard for me to shut off thoughts about myself’), items of the over identification subscale refer to emotional aspects of over-engagement as well (e.g., ‘When something upsets me I get carried away with my feelings’ and ‘When I fail at something important to me I become consumed by feelings of inadequacy’). It may be that participants disengaged more readily from cognitive rumination than painful emotions and experiences. Once again these findings should be interpreted with caution however as Time X Group effects for the rumination subscale of the RRQ fell short of statistical significance.

Other measures of attention did not support the hypothesis that a mindfulness intervention specifically resulted in changes to attention. Whilst participants across conditions demonstrated some degree of hypervigilance to social threat in the Stroop test there was no difference between conditions, suggesting that mindfulness training did not reduce hypervigilance. There was also no evidence of reduced thought suppression suggesting that mindfulness did not have a specific effect on under-engagement of attention.

Overall it seems that the impact of mindfulness training on attention is not clear. While there was no evidence of differences in attention to social threat differences did emerge for attention to some aspects of internal experience (e.g., less attention to ruminative thinking), but not others (e.g., no change to attention to emotions). There may also be differences in the way attention is applied that differ from the direction of attention.

Decentering

Results of this study provide preliminary evidence in support of a possible decentering mechanism for mindfulness. Mindfulness participants rated their conviction in thoughts about themselves or their performance during the speech significantly lower than control participants, suggesting that they were less sure that their thought reflected the reality of the situation. This finding supports other research indicating that mindfulness training may be associated with a decentred perspective of thoughts and feelings (Carmody et al., 2009; Feldman et al., 2010).

Emotion and Behavioural Regulation

There was no evidence of changes to emotion regulation as measured by the TMMS. Participants did not demonstrate increases on either clarity about emotional states or perceived ability to repair negative moods. However, evidence that both mindfulness and relaxation participants may have adopted a more balanced awareness of painful emotions suggests possible improvement to emotion regulation as this way of attending to distress is thought to reflect more adaptive processing of emotions than alternative strategies, such as rumination (Aldao & Nolen-Hoeksema, 2010; Austenfeld & Stanton, 2004)

The extent to which participants engaged in positive and negative self-statements during the speech task might reflect emotion regulation. If participants were more aware of biased thoughts and cognitions, and the effect this had on their emotional state and performance, they may have chosen to disengage from such thoughts and instead engage in a cognitive style that was more useful to promoting their performance. Data from the SSPS scale suggest that while there was no difference between the groups on negative self statements during the speech task, mindfulness participants engaged in significantly more positive self-statements than control participants. This may reflect the beginnings of a change in emotion regulation strategy by this group.

Further evidence of changes to emotion and behavioural regulation are demonstrated by the finding that the mindfulness, but not the relaxation group, had greater decreases in SADS scores as compared to controls. Reduced distress may reflect enhanced emotion regulation, and reduced social avoidance might reflect behavioural regulation as participants overcame habitual tendencies to avoid social situations.

Overall these findings provide initial evidence that a brief mindfulness intervention may be associated with changes to emotion and behaviour regulation. Overall despite the finding that clarity about emotional states and perceived ability to repair negative moods did not change as a result of the intervention, results from other measures (SCS mindfulness subscale, SSPS, SADS) suggest that mindfulness training may have influenced other variables associated with emotion and behavioural regulation. This finding supports other studies indicating that mindfulness training leads to enhanced emotional and behavioural regulation (Gratz et al., 2006; Gregg et al., 2007; Leahey et al., 2008; Lillis et al., 2009; Tull, Schulzinger et al., 2007)

Self-Compassion

In addition to the finding that participants in both the mindfulness and relaxation groups scored higher on the mindfulness subscale of the SCS, both groups also scored higher on the SCS total score than controls groups, indicating that both interventions led to overall increases in self-compassion. Increases in self-compassion across both interventions may partly reflect engagement in a regular 'self-care' activity. To the extent that participants perceived mindful breathing or progressive relaxation to be beneficial for their overall well-being participation in these activities may be deemed self-caring. Similarly, comparable increases in mindful attention to painful emotions suggest that both interventions may have supported participants to become less over-involved with their emotional experience by providing an alternative self-caring strategy for managing distress.

Participants across all three conditions demonstrated an increased tendency to perceive flaws and inadequacies as a universal part of the human experience. This may relate to participation in a group-based study in which participants may have suspected that other group members experienced difficulties with social anxiety similar to their own.

Mindfulness groups demonstrated a greater reduction in tendencies to feel alone and isolated in suffering than participants in other groups. This may relate to aspects of acceptance emphasised by mindfulness. A stance of accepting suffering implies that suffering is a normal part of experience. This contrasts with training in a relaxation technique which implies a need to correct or repair something (i.e., to fix anxiety with relaxation). By normalising suffering through acceptance, the mindfulness intervention may have supported participants to feel less alone in their distress. Recently Van Dam, Sheppard, Forsyth and Earleywine (2011) compared the ability of both the MAAS and the SCS to predict anxiety and depression in a sample of 541 respondents. They found that the SCS was a better predictor of both quality of life and symptom severity than the MAAS and that the isolation and self-judgement scales were particularly useful at making these predictions. This suggests that changes on the isolation subscale may have broader implications for reducing distress.

Overall, the results of this study suggest that, although increases in self-compassion may be observed in association with mindfulness training, they may not relate specifically to the intervention itself and other self-care interventions such as relaxation may also be useful. These findings support data from other studies suggesting that mindfulness can lead to increases in self compassion (Birnie, Speca, & Carlson, 2010; Shapiro et al., 2005; Shapiro et al., 2007) and that outcomes in MBCT are mediated by both mindfulness and self compassion (Kuyken et al., 2010). In addition these findings add to the current literature by suggesting that changes in self compassion may be uniquely associated with relaxation training.

The Acceptability and Utility of Brief Mindfulness Training

Evaluation and effectiveness ratings were similar across both techniques. The absence of any significant difference between conditions suggests that the quality of teaching and materials was comparable across conditions and that each group perceived their technique to be equally effective. The majority of participants in both the mindfulness and relaxation conditions practiced their technique at least four times per week suggesting that at home audio guided practice was an acceptable practice modality for them. In evaluating the technique, the majority of participants in both conditions; found the CD and handbook useful in helping them understand and practice the technique, enjoyed learning the technique and felt that it had been taught in a way that they understood. This provides further support for the acceptability of the techniques and training provided.

With regard to the perceived effectiveness of the techniques however, although over half of the participants in each condition felt that their technique helped them to feel less anxious while waiting to give their impromptu speech, fewer participants felt that the technique made them less anxious during the speech or perform better on the speech indicating that the techniques may have been perceived to be more useful for anticipatory than performance anxiety. Approximately half of the participants in each condition felt that the technique had helped them manage their anxiety in the 4 weeks prior to the intervention period. The same number of participants in the mindfulness condition planned to continue practicing their technique after their involvement with the study was over suggesting that those who had found it useful wanted to continue to experience these benefits through ongoing practice. A much larger number of relaxation participants planned to continue practicing the relaxation technique however which was surprising given only half of these felt that the technique had helped with their anxiety. It may be that they believed they had derived other benefits from practicing the technique (e.g., some participants anecdotally reported improvements in sleep and reduced physical tension in response to the intervention).

Alternatively it may be that participants felt they had not yet achieved the full benefits of the technique but might do so with further practice.

The proportion of participants who would recommend the technique to other people was also unexpectedly high with more than three quarters of the participants indicating that they would do so. This is unexpected given the more moderate ratings of effectiveness. It may be that participants felt that any ineffectiveness of the technique was due to personal characteristics rather than the technique itself and therefore may be more useful for other people. Alternatively, it could be that participants would recommend the techniques to others for reasons other than anxiety management. Overall ratings for the effectiveness of the interventions suggest that many participants found the techniques useful currently, hoped to obtain benefits in the future and thought others might derive benefits too.

Whilst training in progressive muscle relaxation is often provided briefly (Bernstein, 2000), research on mindfulness interventions to date has typically been conducted on more in depth training over longer periods of time. The results of this study suggest that brief, single session mindfulness training, in conjunction with a home practice and phone support is an acceptable and useful intervention.

Limitations of the Study

There are several limitations to this study that should be acknowledged.

Firstly, due to the nature of the design, the experimenter was not blinded to conditions. To manage any possible effects of experimenter expectation participants were provided with materials (CD's and handbooks) that had been established as comparable through pilot testing. In addition there is a possibility that contamination

occurred between conditions as the sample included a large number of university students and staff who may have known each other and may have discussed aspects of the intervention. Participants were asked not to discuss the details of the intervention with other participants but this was dependent on participants complying with this request.

Another limitation of this study is the relatively small sample size. As a result outcomes observed in this study should be interpreted with caution. Further studies with larger groups will be valuable. In addition this study was conducted with a non-clinical sample. Although research suggests that both clinical and non-clinical socially anxious groups demonstrate similarities in information processing (Stopa & Clark, 2001) the results may not be generalizable to a clinical population with greater symptom severity.

A further limitation of this study is that the manner in which mindful attention was utilised during the social stressor task was not directly assessed. It is possible that mindful breathing could be misapplied in this situation and function as a safety behaviour (Clark & Wells, 1995). If participants used mindful breathing purely as a distraction technique and a way of avoiding anxious thoughts and emotions then this approach may provide temporary relief from distress in the same way that other safety behaviours do (e.g., reduced eye contact). Avoidance and safety behaviours have both been implicated in the maintenance of anxiety (Clark & Wells, 1995; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996) and therefore the application of mindfulness in this way would be unlikely to lead to improvements in anxiety and could exacerbate the individual's difficulties. As data was collected over a relatively short time period and the application of mindful techniques not directly assessed we cannot be sure that some participants did not use mindful breathing as a safety behaviour.

Finally, 79% of participants completed the study. Analyses revealed differences between those who did and did not complete the study. Specifically individuals who did not complete the study reported lower levels of self-kindness during times of suffering, greater over-identification with painful emotions and lower levels of self-compassion overall. As a result this group may represent a cohort for whom the intervention was less acceptable. Alternatively it may be that this group were less inclined to attend the final session as a result of the anticipated experimental stressor (speech task) either as a result of identified group differences or another untested variable. Analyses conducted to assess differences between those who did and did not complete the study investigated only baseline data and demographic information. Completers and non-completers may also have differed on a variable that was not tested. For those who did complete the study, outcomes were tested only four weeks after the intervention and therefore additional outcomes that may have arisen if participants continued practicing are not known.

Implications and Future Directions

The results of this study have both theoretical and practical implications. The findings suggest that a brief mindfulness intervention may reduce social avoidance and distress associated with social anxiety, reduce rumination, enhance decentering as measured by thought conviction, increased positive self-statements to regulate emotion during times of distress and reduce feelings of isolation when suffering. These changes address processes of social anxiety and may lead to an overall reduction in distress associated with social anxiety. Another important implication of this study is that a very brief mindfulness intervention did not increase self-focussed attention and lead to a worsening of symptoms. Ratings of the acceptability and utility of this technique suggest that participants perceive mindfulness training as a useful strategy for managing distress. Overall these results suggest that a mindfulness intervention may be accepted by socially anxious adults as a useful intervention approach.

An important theoretical implication of this research is the importance of using comparison groups when conducting research in this field. Time effects were observed on a number of variables including mindfulness, social anxiety, rumination and thought suppression. These variables are commonly tested in this field and in the absence of a comparison group time effects could erroneously be attributed to a specific effect of the intervention.

Although the brief intervention may have influenced emotional and behavioural aspects of social anxiety, social avoidance and distress it did not appear to influence a cognitive aspect, fear of negative evaluation. The relationship between changes to different aspects of social anxiety warrants further investigation. Conceivably a reduction in avoidance behaviours in conjunction with lower distress would result in changes to cognitions and beliefs about the self and the social world as increased social participation created opportunities to evaluate beliefs. Studies that include a longer follow up period may be able to investigate this relationship between emotional, behavioural and cognitive aspects of social anxiety more effectively. Future research exploring longer follow up periods could also explore the possibility that the intervention had added benefits over longer time periods with minimal added intervention time, particularly if follow up continued to be carried out over phone contact. An intervention of this kind could retain qualities of being both brief and cost effective and may be relevant considering the relatively large number of participants who intended to continue practicing after the intervention.

Another area for future research is the possibility of relationship between mindfulness and patterns of passive coping. Passive coping has been associated with more helpless coping styles, brooding and depressive symptoms (Marroquin, Fontes, Scilletta, & Miranda, 2010). If the pattern of diastolic blood pressure observed in this study relates to passive coping then further understanding of the relationship between this coping style and mindfulness training would enable future interventions to address this directly.

In addition the relationship between mindfulness and self-compassion warrants further investigation. Several of the subscales of the self-compassion scale appear to be related to a number of aspects of mindfulness. For example, the mindfulness subscale addresses mindful awareness of painful experiences, and as such also relates to attentional processes, since this implies a balanced attention to emotion that is not impacted by either over or under-engagement strategies. Balanced awareness of emotions may also constitute a form of emotion regulation strategy and therefore may relate to emotion regulation properties of mindfulness as well. Clarification of the relationship between self-compassion and mindfulness may elucidate the relationship between these constructs.

A lack of clarity about the relationship between elements of self-compassion and mindfulness mirrors ambiguities about the nature of mindfulness mechanisms themselves. Aspects of each mechanism appear to overlap with others. For example, changes to attentional processing may reflect emotion regulation. If rumination amounts to a maladaptive regulation strategy then an attentional technique that reduces attention to ruminative content could be classified as an adaptive emotion regulation strategy. Further research is needed delineate each of these mechanisms and their relationships to each other.

Conclusion

This study was the first investigation of brief mindfulness training for social anxiety. The results indicate that a single session intervention and phone contact follow up can generate changes on a number of cognitive processes identified as maintaining social anxiety.

This project involved four study phases designed to investigate the effectiveness of a mindfulness-based intervention for social anxiety. Data collected in study phase 1 suggested that levels of social anxiety experiences among the present research sample population were comparable with those in the United Kingdom (Stopa & Clark, 2001). In addition this data provides the first normative data for a New Zealand sample and will be useful for future New Zealand based research using the FNE as an analogue research tool. The results of study phase 2 suggest that a brief single session mindfulness intervention with the assistance of audio guided at home practice with weekly phone contact is an acceptable intervention modality, and that the effectiveness of this intervention can be assessed via self-report surveys and a single experimental session. The results of study phase 3 provide further support for the application of mindfulness training to social anxiety. Variables associated with mindfulness correlated negatively with measures associated with social anxiety as expected suggesting that the two constructs were inversely related.

Finally data collected from study phase 4 suggests that a brief single session mindfulness intervention may generate change to hypothesised mechanisms of mindfulness identified as being relevant to the treatment of social anxiety. These include reduced rumination, thought conviction, emotional and behavioural regulation and self compassion. Although effects observed in the current study were small, future research using larger sample groups and longer follow up times may demonstrate greater effectiveness. While the intervention did not lead to increases in trait mindfulness, or decreases in fear of negative evaluation, the pattern of results described, in conjunction with positive evaluations of the technique and training from participants' suggest that further investigations of brief mindfulness are warranted.

A key feature of this study was the comparison of brief training in a single mindfulness modality to two kinds of control groups, wait-list control and relaxation. This enabled us to explore the efficacy and specific effects of the intervention without the confounding influence of other treatment aspects. Consequently training effects

observed are likely to relate to the intervention and provide the first example of the application of this treatment approach to social anxiety. As a result, this study contributes to understandings of how mindfulness works as a therapeutic mechanism and what effect it might have on the experience of social anxiety.

APPENDICES

APPENDIX A
Fear of Negative Evaluation Survey

Please read the statements below and think carefully about whether or not they apply to you. If you think a statement does apply to you circle T for true. If you do not think a statement applies to you circle F for false. Please provide an answer for every statement. If you cannot decide whether a statement does or does not apply to you circle F for false.

- | | | | |
|---|---|-----|---|
| T | F | 1. | I rarely worry about seeming foolish to others. |
| T | F | 2. | I worry about what people will think of me even when I know it doesn't make any difference. |
| T | F | 3. | I become tense and jittery if I know someone is sizing me up. |
| T | F | 4. | I am unconcerned even if I know people are forming an unfavourable impression of me. |
| T | F | 5. | I feel very upset when I commit a social error. |
| T | F | 6. | The opinions that important people have of me cause me little concern. |
| T | F | 7. | I am often afraid that I may look ridiculous or make a fool of myself. |
| T | F | 8. | I react very little when other people disapprove of me. |
| T | F | 9. | I am frequently afraid of other people noticing my shortcomings. |
| T | F | 10. | The disapproval of others would have little effect on me. |
| T | F | 11. | If someone is evaluating me I tend to expect the worst. |
| T | F | 12. | I rarely worry about what kind of impression I am making on someone. |
| T | F | 13. | I am afraid that others will not approve of me. |
| T | F | 14. | I am afraid that people will find fault with me. |
| T | F | 15. | Other people's opinions of me do not bother me. |
| T | F | 16. | I am not necessarily upset if I do not please someone. |
| T | F | 17. | When I am talking to someone, I worry about what they may be thinking about me. |

- T F 18. I feel that you can't help making social errors sometimes so why worry about it.
- T F 19. I am usually worried about what kind of impression I make.
- T F 20. I worry a lot about what my superiors think of me.
- T F 21. If I know someone is judging me, it has little effect on me.
- T F 22. I worry that others will think I am not worthwhile.
- T F 23. I worry very little about what others may think of me.
- T F 24. Sometimes I think I am too concerned with what other people think of me.
- T F 25. I often worry that I will say or do the wrong things.
- T F 26. I am often indifferent to the opinions others have of me.
- T F 27. I am usually confident that others will have a favourable impression of me.
- T F 28. I often worry that people who are important to me won't think very much of me.
- T F 29. I brood about the opinions my friends have about me.
- T F 30. I become tense and jittery if I know I am being judged by my superiors.

APPENDIX C1
CD Audio Recording Script: Mindfulness

Time
(mins)

0.00 Settle into a comfortable sitting position, either on a straight backed chair or on a soft surface on the floor, supported by cushions or a low stool. If you use a chair, it is very helpful to sit away from the back of the chair so that your spine is self supporting. If you sit on the floor, it is helpful if your knees actually touch the floor; experiment with the height of the cushions or stool until you feel comfortably and firmly supported.

Pause

Allow your back to adopt an alert, dignified, and comfortable posture. The back should be upright but not stiff, and aligned with the neck and the head. Shoulders are relaxed and the chin is tucked in a little. If sitting on a chair, place your feet flat on the floor with your legs uncrossed. Gently close your eyes. If you are very tired and concerned about drifting off, you may keep your eyes open but softly focussed on a particular object in front of you.

Pause

1.00 Bring your awareness to the level of physical sensations by focussing your attention on the sensations of touch and pressure in your body where it makes contact with the floor and whatever you are sitting on.

Pause

3.00 When you are ready, become aware of the fact that you are breathing. Bringing your awareness to the changing patterns of physical sensations in the lower abdomen as the breath moves in and out of your body. Alternatively you can bring your attention to the passage of air through the nostrils, or anywhere else that the breath sensations are accessible and vivid for you.

Pause

Just feel the breath coming into the body and leaving the body. Follow the breath sensations as best you can with your full attention moment by moment by and breath by breath

Pause

As best you can, follow with your awareness the full duration of each breath coming into the body on the in breath and leaving the body on the out breath, perhaps noticing the slight pauses between one in breath and the following out breath, and between one out breath and the following in breath.

Pause

Its best if you can stay with the breath in a particular location in the body for the full duration of a practice period, so if you start with the abdomen or the nostrils then the suggestion is to stay with the sensations in that area, cultivating a greater stability of attention.

Pause

4.00 There is no need to try and control the breathing in anyway- simply let the breath breathe itself. As best you can, also bring this attitude of allowing to the rest of your experience. There is nothing to be fixed, no particular state to be achieved. As best you can simply allow your experience to be your experience, without needing it to be other than it is.

Pause

- 5.00 Sooner or later your mind will wander away from the focus on the breath in the lower abdomen to thoughts, planning, daydreams, drifting along- whatever. This is perfectly OK- it is simply what minds do. It is not a mistake or a failure. When you notice that your awareness is no longer on the breath, gently congratulate yourself. You have come back and are once more aware of your experience.

Pause

Whenever you find your mind has wandered, notice what is on your mind in that moment, whatever it is, and then gently let go of it. This doesn't mean pushing it away, just recognise it, and let it be, as you escort your attention back to the breath, renewing the intention to pay attention to the ongoing in breath or out breath, whichever you find.

Pause

- 7.00 However often you notice that the mind has wandered (and this will quite likely happen over and over again), as best you can, congratulate yourself each time on reconnecting with your experience in the moment, and gently escort your attention back to the breath, once again following with awareness the changing pattern of physical sensations that come with each in breath and each out breath.

Pause

Without being harsh or critical or judging of yourself, simply recognise what is arising for what it is and let it be. Come back to feeling this breath in this moment, and begin again and again. Each time for the first time, each moment the only moment, since our lives are unfolding here and now and only here and now no matter what our thoughts are telling us.

Pause

- 10.00 As best you can bring that quality of kindness to your awareness, perhaps seeing the repeated wanderings of the mind as opportunities to bring patience and gentle curiosity to your experience.

Pause

Since it is in the nature of the mind to wander it's not that you are failing at meditation if your mind doesn't stay on the breath. It's that you are discovering something exceedingly important about the nature of the mind itself. And that is, that it waves, just as the ocean waves. So it's never a matter of putting a stop to it, trying to shut off your thinking or make your mind go blank. But rather familiarising yourself with the nature and the ways of your own mind, grounded in an awareness that is wiser than thinking, which grows out of our bringing the mind back to the breath over and over, allowing each in breath to be a new beginning and each out breath a complete letting go.

Pause

- 14.30 Soon you will hear the sound of the bell to signal the end of the practice. Please use this sound to mindfully bring the practice to a close.

APPENDIX C2
CD Audio Recording Script: Relaxation

Time
(mins)

0.00 Sit in a comfortable reclining chair or lie on a soft bed. Be sure that the room you are in is quiet and free from interruptions. It is a good idea to have a blanket with you since your body temperature may drop dramatically during relaxation.

Progressive relaxation involves focussing your attention on one muscle group at a time. Please pay attention only to what I am saying and the sensations in that muscle group, allowing the rest of your body to remain relaxed. When I ask you to tense a muscle group, I will say, for example, "Tense the muscles in your forehead by raising your eyebrows, now." "Now" will be the cue word for you to tense your muscles. Do not tense the muscles until I say "now". When I want you to relax a muscle group, I will say "Relax the muscles in your forehead." When I say that, let all the tension go all at once, not gradually. This allows the muscles to relax more deeply. Try not to move any more than is necessary to remain comfortable. In order to gain the maximum benefit from relaxation, it is preferable not to move any muscles that have already been relaxed. This prevents tension from reappearing in those muscles.

1.00 Focus all of your attention on the muscles of your right hand and lower arm. Tense these muscles by making a tight fist now. You should be able to feel tension in the hand, over the knuckles, and up to the lower arm. (5 seconds)

Relax these muscles and concentrate on the pleasant sensations of relaxation in you right hand and forearm. (25 seconds)

1. 38 Focus all of your attention on the muscles of your left hand and lower arm. Tense these muscles by making a tight fist now. Once again you should be able to feel tension in the hand, over the knuckles, and up to the lower arm. (5 seconds)

Relax the muscles in your left hand and lower arm. Let all the tension go, focussing on these muscles as they just relax completely (25 seconds)

2. 16 Focus your attention on the muscles in your right bicep. Tense these muscles by pushing your elbow against the chair or bed now. You should be able to get a feeling of tension in the biceps without involving the muscles in the lower arm or hand. (5 seconds)

Relax, focussing all of your attention on the feelings of relaxation flowing into this area. (25 seconds)

2. 54 Focus your attention on the muscles in your left bicep. Once again, tense these muscles by pushing your elbow against the chair or bed now. (5 seconds)

Relax. There is nothing for you to do but focus your attention on the pleasant feelings of relaxation flowing into this area. (25 seconds)

3. 32 Focus your attention on the muscles in your forehead area. Tense these muscles by lifting your eyebrows as high as you can now. You should be able to feel tension in your forehead and up into the scalp region. (5 seconds)

Relax and release this tension. Just experience the sensations of deep complete relaxation flowing into these muscles. (25 seconds)

- 4.10 Focus your attention on the muscles in the central part of your face, around the upper part of your cheeks. Tense these muscles by squinting your eyes very tightly and wrinkling up your nose at the same time now. You should be able to feel tension around your eyes and upper parts of your cheeks. (5 seconds)

Relax and let all the tension go, focussing on these muscles as they just relax completely (25 seconds)

4. 48 Focus your attention on the muscles in the lower part of your face. Tense these muscles by biting your teeth together and pulling the corners of your mouth back now. You should feel tension all through the lower part of your face and in your jaw. (5 seconds)

Relax, focussing all of your attention of the feelings of relaxation flowing into this area. (25 seconds)

- 5.26 Focus on the muscles in your neck and throat. Tense these muscles by pulling your chin downwards towards your chest and at the same time try to prevent it from actually touching your chest. Do this now. You should feel just a little bit of shaking or trembling in these muscles. (5 seconds)

Relax and release this tension noticing what it feels like as these muscles go on and on relaxing. (25 seconds)

- 6.04 Focus your attention on the muscles of your chest, shoulders and upper back. Tense these muscles by taking a deep breath, holding it and at the same time pulling your shoulder blades together; that is pull your shoulders back and try to make the shoulder blades touch. Do this now. You should feel significant tension in your chest, shoulders and upper back. (5 seconds)

Now relax and enjoy the feelings in these muscles as they loosen up, smooth out, unwind, and relax more and more deeply.

- 6.42 Focus on the muscles in your abdomen. Tense your abdominal muscles by making your stomach go hard, as though you are trying to push your stomach muscles in and out at the same time. Do this now. You should feel a good deal of tension and tightness in the stomach area. (5 seconds)

Relax. Release these muscles and concentrate on the pleasant sensations of relaxation in you abdomen.

- 7.26 Focus your attention on your right thigh. Tense these muscles by counter posing the large muscle on top of the leg with the two smaller ones underneath; you should be able to feel that large top muscle get quite hard. Do this now. (5 seconds)

Relax. Focus all of your attention on the feelings associated with relaxation flowing in to these areas.

- 8.04 Focus your attention on the muscles of the right calf and lower leg. Tense these muscles by pulling your toes upwards towards your head. You should be able to feel tension all through the calf area. Do this now. (5 seconds)

Relax and let all the tension go, focussing on these muscles as they just relax completely (25 seconds)

- 8.42 Focus your attention on the muscles in your right foot. Tense these muscles by pointing your toe turn your foot inward and at the same time curl your toes. Do this now. Don't tense these muscles very hard, just enough to feel the tightness under the arch and in the ball of the foot. (5 seconds)

Relax and enjoy the feelings in these muscles as they loosen up, smooth out, unwind, and relax more and more deeply. (25 seconds)

- 9.26 Focus your attention on your left thigh. Tense these muscles by counter posing the large muscle on top of the leg with the two smaller ones underneath. Do this now. (5 seconds)

Relax. Release these muscles and concentrate on the pleasant sensations of relaxation in you thigh. (25 seconds)

- 10.04 Focus your attention on the muscles of the left calf and lower leg. Tense these muscles now by pulling your toes upwards towards your head. (5 seconds)

Relax and release this tension. Just experience the sensations of deep complete relaxation flowing into these muscles. (25 seconds)

- 10.42 Focus your attention on the muscles in your left foot. Tense these muscles now by pointing your toe, turn your foot inward and at the same time curl your toes.

Relax. There is nothing for you to do but focus your attention on the pleasant feelings of relaxation flowing into this area.

- 11.26 Continue to allow all of the muscles in your body to relax. Relax completely and enjoy the pleasant feelings of relaxation as they go on and on relaxing. Just experience the sensations of deep, complete relaxation. Calm, peaceful and relaxed.

- 14.26 I will now count backward from 4 to 1. 4, begin to move your legs and feet; 3, move your arms and hands; 2, move your head and neck; and 1 open your eyes, feeling calm and relaxed, just as if you've had a brief nap .

APPENDIX D
Measure for Evaluation of CD Recordings

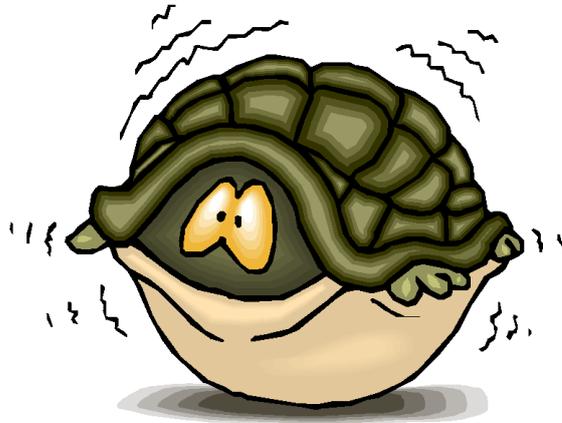
Gender: M/ F

CD: Relaxation/ Mindfulness

Please indicate the extent to which you agree or disagree with the following

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The recording is clear.	1	2	3	4	5
The voice in the recording motivates me to practice the technique.	1	2	3	4	5
The voice in the recording is relaxing.	1	2	3	4	5
The instructions are easy to follow.	1	2	3	4	5
The voice in the recording is not comfortable to hear.	1	2	3	4	5
The instructions in the recording have guided me to practice the technique.	1	2	3	4	5
The recording is of appropriate length.	1	2	3	4	5
The voice in the recording does not convince me to practice the technique.	1	2	3	4	5
The recording has soothing instructions.	1	2	3	4	5
The voice in the recording is engaging.	1	2	3	4	5

APPENDIX E1
Recruitment Poster



Ever feel a bit shy?

Lots of people feel anxious in social settings, such as parties or *classrooms, where they are expected to interact with people they don't* know well. It is also common for people to feel worried about situations in which they will have to perform in front of people, such as giving a speech or a class presentation. I am conducting a study investigating ways of helping people to feel less anxious and worried in these sorts of situations.

I am looking for participants interested in learning techniques to help them manage anxiety. Interested potential participants will be asked to complete an online survey and those that score within a targeted range will be invited to participate in the study. Participants will learn one of two techniques in small groups to manage feelings of worry and anxiety. They will then be asked to practice this technique for 4 weeks before attending a final 2 hour experimental session during which they will be able to test out the technique they have learned in a situation that might previously have been challenging.

If you are interested please contact Alex Rowell email
managinganxiety@gmail.com

This research has been approved by the University of Auckland Human Participants Ethics Committee (Ref. 2007/388)

APPENDIX E2
Recruitment Email

Hello,

My name is Alexandra Rowell and I am a Clinical Psychology Doctoral Candidate from the University of Auckland. As part of my doctoral thesis I am investigating techniques to help people manage stress and anxiety in social and performance situations. I am currently looking for participants who might be interested in learning these kinds of techniques as I am hoping to recruit a further 40 participants to my study.

I was hoping you might be able to help me distribute the information below about my study by sending this email out to any distribution lists you have. Please note that I am also very interested in hearing from any members of your staff who might be interested in participating. Members of the general public are also welcome to participate so feel free to forward this email to any friends or family you think might be interested in the study.

If you would like any more information about the study or have any questions at all please don't hesitate to contact me.

Many thanks,

Alex Rowell

Strategies to Manage Stress and Anxiety

Many people find they feel anxious in social settings, such as parties or classrooms, where they are expected to interact with people they don't know well. It is also common for people to feel worried about situations in which they will have to perform in front of people, such as giving a speech or a class presentation. As part of my research I am looking at ways of helping people to feel less anxious in these types of situations.

I am looking for participants interested in learning ways to manage anxiety. Interested potential participants will be asked to complete an online survey and those people that score within a targeted range on this survey will be invited to participate in the study.

Participants in the study will learn one of two techniques to manage anxiety. They will then be asked to practice this technique for 4 weeks before attending a final 2 hour experimental session during which they will be able to test out the technique they have learned in a situation that might previously have been challenging.

If you are interested contact Alex Rowell email managinganxiety@gmail.com to obtain more information or click on the link below to complete the screening survey.

http://www.surveymonkey.com/s.aspx?sm=TdO3SR98034HQKGArJDSqg_3d_3d

Thank you!!

APPENDIX E3
Recruitment CECIL Posting

Strategies to manage stress and anxiety in social and performance situations

Many people find they feel anxious in social settings, such as parties or classrooms, where they are expected to interact with people they don't know well. It is also common for people to feel worried about situations in which they will have to perform in front of people, such as giving a speech or a class presentation. As part of my research I am looking at ways of helping people to feel less anxious in these types of situations. I am looking for 90 participants interested in learning ways to feel less anxious in social and performance situations. Interested potential participants will be asked to complete an online survey and those people that score within a targeted range on this survey will be invited to participate in the study. Participants in the study will learn one of two techniques to manage feelings of worry in social and performance situations. They will then be asked to practice this technique for 4 weeks before attending a final 2 hour experimental session during which they will be able to test out the technique they have learned in a situation that might previously have been challenging. Some participants will be placed in a control condition in which they will attend both sessions and learn techniques at the end of these. Training and experimental sessions will be conducted at the city campus.

If you are interested please contact Alex Rowell email managinganxiety@gmail.com to obtain more information or complete the screening survey.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 5/12/07 for 3 years on 5/12/07 to 5/12/10 Reference Number 2007/388

APPENDIX F1
Participant Information Sheet: Study Phase 3



Department of Psychology

University of Auckland
Private Bag 92019, Auckland
New Zealand

Building 721,
261 Morrin Road,
Glen Innes
Ph: 373 7599 ext 84990

PARTICIPANT INFORMATION SHEET - Participant Screening

Project Title: Strategies for managing anxiety in social and performance situations

Researcher: Alexandra Rowell

Supervisor: Associate Professor Linda Cameron

Dear Potential Participant,

My name is Alexandra Rowell and I am a doctoral student in the Department of Psychology. I am conducting this research for my Doctor of Clinical Psychology thesis. I am interested in investigating ways of helping people to feel less anxious in social and performance situations. Many people find they feel anxious in social settings, such as parties or classrooms, where they are expected to interact with people they don't know well. It is also common for people to feel worried about situations in which they will have to perform in front of people, such as giving a speech or a class presentation. As part of my research I am looking for participants whose scores fall within a targeted range on an initial screening survey. Participants whose scores fall within this range will be invited to participate in a study investigating ways in which the amount of anxiousness people feel in these types of situations can be reduced. This research is funded by the researchers Postgraduate Research Student Support account.

You are invited to complete the screening survey about experiences of anxiety in social and performance situations. This survey takes approximately 15 minutes to complete. You can complete this survey online and the results of the survey will be sent to me. If your score on the survey falls within the targeted range you will be contacted by email and invited to participate in the study.

Your participation is entirely **voluntary**. Your grades and academic relationships with university staff will not be affected by refusal or agreement to participate. You may withdraw from the survey at any time prior to completing it without giving a reason, however survey responses cannot be withdrawn from the study once they have been submitted.

Data will be kept in the form of computer and paper files. This will remain confidential and only accessible to my supervisors and me. The data collected from this study will be stored in a locked filing cabinet for 6 years and may be used for publication or future research.

All data collected will remain confidential and anonymity will be protected where possible. Where data provided by you is reported or published this will be done in such a way that you cannot be identified as the source.

There are no known risks caused by this study. However, there is a chance that the survey may raise concerns about general experiences of anxiousness in social situations. In the unusual circumstance that you were to experience significant worry and emotional distress, then my secondary supervisor Associate Professor John Read, who is a registered clinical psychologist, may be contacted for referral to an appropriate agency for counselling and assistance. Please contact me if you have any questions or concerns about the survey, if the study raises any questions or concerns about anxiety in social situations, or if you would like more information about the study.

Contacts

Researcher: Alexandra Rowell email ahay043@ec.auckland.ac.nz, or mail Department of Psychology (Tamaki Campus), The University of Auckland, Private Bag 92019, Auckland.

Primary supervisor: Associate Professor Linda Cameron ph: (09) 373 7599, l.cameron@auckland.ac.nz, Department of Psychology (Tamaki Campus), The University of Auckland, Private Bag 92019, Auckland.

Secondary supervisor: Associate Professor John Read ph: (09) 373 7599, j.read@auckland.ac.nz, Department of Psychology (Tamaki Campus), The University of Auckland, Private Bag 92019, Auckland.

Head of department: Associate Professor Fred Seymour ph: (09) 373 7599, f.seymour@auckland.ac.nz, Department of Psychology (City Campus), the university of Auckland, Private Bag 92019, Auckland.

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Telephone 09 373 7599 extn. 87830.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 5/12/07 for 3 years on 5/12/07 to 5/12/10 Reference Number 2007/388

APPENDIX F2
Electronic Consent Form



Department of Psychology
University of Auckland
Private Bag 92019, Auckland
New Zealand

Building 721,
261 Morrin Road,
Glen Innes
Ph: 373 7599 ext 84990

ELECTRONIC CONSENT FORM
Participant Screening

Project Title: Strategies for managing anxiety in social and performance situations

Researcher: Alexandra Rowell
Supervisor: Associate Professor Linda Cameron

I have read and understand the information describing the aims and content of the survey. I have had the opportunity to ask questions and have them answered. I am 16 years or older. I understand that, by submitting this survey electronically, I agree to take part in this research under the terms indicated in the Participant Information Sheet. I understand that if my score on the survey falls within the targeted range I will be contacted and invited to participate in the study. I understand that my participation or non-participation will not affect my grades or my academic relationships with the department or members of the academic staff in any way. I agree to have my data stored in a password-protected database for a period of 6 years. I understand that I may withdraw from the survey at any time without giving a reason, but that my survey responses cannot be withdrawn from the study once they have been submitted

[click ACCEPT to proceed to survey] OR [click DECLINE to exit]

**APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN
PARTICIPANTS ETHICS COMMITTEE ON 5/12/07 for 3 years on 5/12/07 to
5/12/10 Reference Number 2007/388**

APPENDIX G
Self Compassion Scale

Please indicate how often you act in the manner stated in each of the items on a scale of 1 (almost never) to 5 (almost always).

	Almost never				Almost always
I try to be understanding and patient towards those aspects of my personality I don't like. (SK)	1	2	3	4	5
I'm kind to myself when I'm experiencing suffering. (SK)	1	2	3	4	5
When I'm going through a very hard time, I give myself the caring and tenderness I need. (SK)	1	2	3	4	5
I'm tolerant of my own flaws and inadequacies. (SK)	1	2	3	4	5
I try to be loving towards myself when I'm feeling emotional pain (SK)	1	2	3	4	5
When I see aspects of myself I don't like, I get down on myself (SJ)	1	2	3	4	5
When times are really difficult, I tend to be tough on myself. (SJ)	1	2	3	4	5
I can be a bit cold-hearted towards myself when I'm experiencing suffering. (SJ)	1	2	3	4	5
I'm disapproving and judgmental about my own flaws and inadequacies. (SJ)	1	2	3	4	5
I'm intolerant and impatient towards those aspects of my personality I don't like. (SJ)	1	2	3	4	5
When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people. (CH)	1	2	3	4	5

	Almost never				Almost always
I try to see my failings as part of the human condition. (CH)	1	2	3	4	5
When I'm down and out, I remind myself that there are lots of people in the world feeling like I am. (CH)	1	2	3	4	5
When things are going badly for me, I see the difficulties as part of life that everyone goes through. (CH)	1	2	3	4	5
When I fail at something that's important to me I tend to feel alone in my failure. (IS)	1	2	3	4	5
When I think about my inadequacies it tends to make me feel more separate and cut off from the rest of the world. (IS)	1	2	3	4	5
When I'm feeling down I tend to feel like most other people are probably happier than I am. (IS)	1	2	3	4	5
When I'm struggling I tend to feel like other people must be having an easier time of it. (IS)	1	2	3	4	5
When something upsets me I try to keep my emotions in balance. (MF)	1	2	3	4	5
When I'm feeling down I try to approach my feelings with curiosity and openness. (MF)	1	2	3	4	5
When something painful happens I try to take a balanced view of the situation. (MF)	1	2	3	4	5
When I fail at something important to me I try to keep things in perspective. (MF)	1	2	3	4	5
When something upsets me I get carried away with my feelings. (OI)	1	2	3	4	5
When I'm feeling down I tend to obsess and fixate on everything that's wrong. (OI)	1	2	3	4	5
When something painful happens I tend to blow the incident out of proportion. (OI)	1	2	3	4	5

	Almost never				Almost always
When I fail at something important to me I become consumed by feelings of inadequacy. (OI)	1	2	3	4	5

(SK) self-kindness subscale. (SJ) self-judgement subscale. (CH) common humanity subscale. (IS) isolation subscale. (MF) mindfulness subscale (OI) over-identification subscale

APPENDIX H
Mindful Attention Awareness Scale

Below is a collection of statement about your everyday experiences. Using the 1-6 scale below, please indicate how frequently or infrequently you have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be.

	Almost always	Very frequently	Somewhat frequently	Somewhat infrequently	Very infrequently	Almost never
I could be experiencing some emotion, and not be conscious of it until sometime later.	1	2	3	4	5	6
I break or spill things because of carelessness, not paying attention or thinking of something else.	1	2	3	4	5	6
I find it difficult to stay focussed on what's happening in the present.	1	2	3	4	5	6
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
I tend not to notice feelings of tension or physical discomfort until they really grab my attention.	1	2	3	4	5	6
I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
It seems I am "running on automatic" without much awareness of what I'm doing.	1	2	3	4	5	6
I rush through activities without really being attentive to them.	1	2	3	4	5	6

	Almost always	Very frequently	Somewhat frequently	Somewhat infrequently	Very infrequently	Almost never
I get so focussed on the goal I want to achieve that I lose touch with what I am doing right now to get there.	1	2	3	4	5	6
I do jobs or tasks automatically without being aware of what I am doing.	1	2	3	4	5	6
I find myself listening to someone else with one ear, doing something else at the same time.	1	2	3	4	5	6
I drive places on “automatic pilot” then wonder why I went there.	1	2	3	4	5	6
I find myself preoccupied with the future or the past.	1	2	3	4	5	6
I find myself doing things without paying attention.	1	2	3	4	5	6
I snack without being aware that I am eating.	1	2	3	4	5	6

APPENDIX I
Satisfaction with Life Scale

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by circling the appropriate number.

1=strongly disagree, 2=disagree, 3= slightly disagree, 4= neither agree nor disagree, 5=slightly agree, 6=agree, 7=strongly agree

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
In most ways my life is ideal.	1	2	3	4	5	6	7
The conditions of my life are excellent.	1	2	3	4	5	6	7
I am satisfied with my life.	1	2	3	4	5	6	7
So far I have gotten the important things I want in life.	1	2	3	4	5	6	7
If I could live my life over, I would change almost nothing	1	2	3	4	5	6	7

APPENDIX J
Post Event Processing Questionnaire

I would like you to remember one specific social situation which has led to strong anxiety or discomfort, or in which you had a strong feeling of shame, DURING THE PAST MONTH. Please let yourself be guided by the situations listed below. If you remember more than one situation, please choose the one that was most relevant for you. Please mark the situation you have chosen.

- Talking in front of a group
- Being at a party
- Talking to superiors or people in a position of authority
- Participating in group activities
- Using public toilets
- Returning goods to a store
- Beginning/ maintaining a conversation
- Expressing disapproval
- Talking on the phone
- Initiating a romantic relationship
- Dating someone
- Oral exams
- Eating/drinking/writing in public
- Talking on the phone with others listening
- Giving a party
- Formal and informal meetings
- Being criticized
- Other situation

Please refer to this situation while answering the following questions. Please indicate the extent to which you agree or disagree with the following statements on a scale between 1 (if you do not agree at all) and 10 (if you agree extremely with the statement).

	Do not agree at all									Agree extremely
	1	2	3	4	5	6	7	8	9	10
After the event was over, I thought about it a lot. (CI)	1	2	3	4	5	6	7	8	9	10
Memories and thoughts about the event kept coming into my head even when I did not wish to think about it. (CI)	1	2	3	4	5	6	7	8	9	10

	Do not agree at all									Agree extremely
	1	2	3	4	5	6	7	8	9	10
Thoughts about the event interfered with my concentration. (CI)	1	2	3	4	5	6	7	8	9	10
I found it difficult to forget about the event. (CI)	1	2	3	4	5	6	7	8	9	10
I tried to resist thinking about the event. (CI)	1	2	3	4	5	6	7	8	9	10
Repeatedly thinking about the event made my feelings about it get worse. (CI)	1	2	3	4	5	6	7	8	9	10
I wondered whether I could have avoided or prevented my behaviour/ feelings during the event. (PF)	1	2	3	4	5	6	7	8	9	10
I wished that I could turn the clock back and do it again but better this time. (PF)	1	2	3	4	5	6	7	8	9	10
As a result of the event, I am now avoiding similar situations. (AV)	1	2	3	4	5	6	7	8	9	10
This event reinforced my pre-existing avoidance of similar situations (AV)	1	2	3	4	5	6	7	8	9	10
I experienced a sense of shame while remembering my behaviour during the situation. (NS)	1	2	3	4	5	6	7	8	9	10
I thought about anxious feelings that I had experienced during the event. (PF)	1	2	3	4	5	6	7	8	9	10
When remembering the situation other instances of past failure that I had experienced in the same way came into my mind (PF)	1	2	3	4	5	6	7	8	9	10

	Do not agree at all									Agree extremely
I criticized myself for my behaviour in this situation (NS)	1	2	3	4	5	6	7	8	9	10
I thought about the event more than I wanted to (CI)	1	2	3	4	5	6	7	8	9	10
I thought about bodily sensations I had experienced in the situation (PF)	1	2	3	4	5	6	7	8	9	10
In my memories about the event I saw myself (behaviour, attributes) in a positive/ negative way (NS)	1	2	3	4	5	6	7	8	9	10
Please indicate the extent to which you saw your behaviour as positive/negative on a scale between 1 (entirely positive) to 10 (entirely negative).										

(CI) cognitive impairment. (PF) thoughts of past and future. (NS) negative self-perception.
(AV) avoidance

APPENDIX L1
Participant Information Sheet: Study Phase 4



Department of Psychology
University of Auckland
Private Bag 92019, Auckland
New Zealand

Building 721,
261 Morrin Road,
Glen Innes
Ph: 373 7599 ext 84990

PARTICIPANT INFORMATION SHEET - Participants

Project Title: Strategies for managing anxiety in social and performance situations

Researcher: Alexandra Rowell

Supervisor: Associate Professor Linda Cameron

Dear Potential Participant,

My name is Alexandra Rowell and I am a doctoral student in the Department of Psychology. I am conducting this research for my Doctor of Clinical Psychology thesis. As part of my research I am looking at ways of helping people to feel less anxious in social and performance situations. Many people find they feel anxious in social settings, such as parties or classrooms, where they are expected to interact with people they don't know well. It is also common for people to feel worried about situations in which they will have to perform in front of people, such as giving a speech or a class presentation. This research is funded by the researchers Postgraduate Research Student Support account and aims to examine the mechanisms by which the amount of anxiousness people feel in these types of situations can be reduced.

You are invited to participate in a study about the reduction of anxiety in social and performance situations. You have been selected for this study because your score on the online screening survey fell within our targeted range. If you participate in this study you will be asked to attend a one hour assessment and training session with a small group of 3 to 5 other participants. During this session you will have your heart rate and blood pressure measured, and complete a range of surveys about your experiences of anxiety, sleep, physical activity, alcohol consumption and tendency to complete daily tasks without paying attention. You will then learn about one of two techniques to reduce the amount of anxiety you feel in social and performance situations, and be asked to practice this technique for 15 minutes a day for a total of four weeks. You will be contacted by phone once a week during this time to discuss any difficulties you may be having with your technique. At the end of this four week period you will be asked to attend a final two hour experimental session during which you will be able to test out the technique you have learned in a situation that might

previously have been challenging. You will have your heart rate and blood pressure measured again and will be asked to complete the surveys described above for a second time. Some participants will be placed in a control condition in which they will attend both sessions and learn techniques at the end of these. In total you will be asked to give up to 10 hours of your time to this study. Both the training and experimental sessions will be conducted by me and will take place at the University of Auckland Tamaki and City Campuses.

Your participation is entirely **voluntary** and you may withdraw from the study at any time. Your grades and academic relationships with University of Auckland staff will not be affected by refusal or agreement to participate. After participating in the research you may withdraw any data collected from you until 2 weeks after participation. In this case please contact me and any information collected from you will be deleted and/ or shredded where appropriate.

Data will be kept in the form of computer and paper files. This will remain confidential and only accessible to my supervisors and me. If any research assistants are employed they will be required to sign a confidentiality agreement to this effect. The data collected from this study will be stored in a locked filing cabinet for 6 years and may be used for publication or future research.

All data collected from participants will remain confidential and anonymity will be protected where possible. Since some of the research will be conducted in group settings however absolute anonymity can not be guaranteed. I can not guarantee that other participants will keep information they learn about you during group sessions confidential. Where data provided by you is reported or published this will be done in such a way that you can not be identified as the source. If during the course of data collection I am given information that reveals a reasonable possibility that the life or health of any person may be at serious risk then I have a moral and legal obligation to breach confidentiality and report that risk to the appropriate authorities and appropriate others.

There are no known risks caused by this study. However, there is a chance that you may experience some anxiety during some parts of the experimental session since this will include testing your technique in a previously challenging situation. It is also possible that the technique you learn might make you more aware of physical sensations of anxiousness if you experience these. In the unusual circumstance that you were to experience significant worry and emotional distress, then my secondary supervisor Associate Professor John Read, who is a registered clinical psychologist, may be contacted for referral to an appropriate agency for counselling and assistance.

By participating in this research you will be learning strategies for managing stress and anxiety in situations commonly encountered in university settings. At the end of participation each participant will be provided with CD's and information sheets for the other techniques so that every one will have access to all of the anxiety management strategies. The provision of CD's will not be effected by your right to withdraw yourself or your data from the research.

If you are interested in the results of the research please indicate this on the consent form. Please contact me if you have any questions or concerns about the study, if the study raises any questions or concerns about anxiety in social situations, or if you would like more information about the study.

Contacts

Researcher: Alexandra Rowell ph: (09) 373 7599 extn 84990, or email ahay043@aucklanduni.ac.nz, or mail Department of Psychology (Tamaki Campus), The University of Auckland, Private Bag 92019, Auckland.

Primary supervisor: Associate Professor Linda Cameron ph: (09) 373 7599 extn 86869, l.cameron@auckland.ac.nz, Department of Psychology (Tamaki Campus), The University of Auckland, Private Bag 92019, Auckland.

Secondary supervisor: Associate Professor John Read ph: (09) 373 7599 extn 85011, j.read@auckland.ac.nz, Department of Psychology (Tamaki Campus), The University of Auckland, Private Bag 92019, Auckland.

Head of department: Associate Professor Fred Seymour ph: (09) 373 7599 extn 88414, f.seymour@auckland.ac.nz, Department of Psychology (City Campus), the university of Auckland, Private Bag 92019, Auckland.

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Telephone 09 373 7599 extn. 87830.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 5/12/07 for 3 years on 5/12/07 to 5/12/10 Reference Number 2007/388

APPENDIX L2
Consent Form: Study Phase 4



Department of Psychology
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New Zealand

Building 721,
261 Morrin Road,
Glen Innes
Ph: 373 7599 ext 84990

CONSENT FORM – Participants
(This consent form will be stored for a period of six years)

Project Title: Strategies for managing anxiety in social and performance situations

Researcher: Alexandra Rowell
Supervisor: Associate Professor Linda Cameron

I agree to take part in this research.

I have read the Participant Information Sheet for this study about the reduction of anxiety in social and performance situations. I understand that I have been selected to participate in the research because my score on the online screening survey fell within a targeted range. I have been given the opportunity to ask questions and have them answered to my satisfaction. I understand that my participation in this research is voluntary.

- I understand that my decision to participate or not participate in this study will not affect my grades or relationships with university staff.
- I understand that as a participant in this research I will be required to attend an initial training session and a follow up experimental session at the University of Auckland Tamaki campus, and that I will be asked to practice a specific technique 15 minutes per day for a 4 week period. I am aware that I will be asked to give approximately 10 hours of my time to this study.
- I understand that as part of this study I will have my heart rate and blood pressure measured and will be asked to complete surveys about my experiences of anxiety, sleep, physical activity, alcohol consumption and tendency to complete daily tasks without paying attention.
- I understand that I may experience some anxiety during parts of the experimental session and that the technique I learn may make me temporarily more aware of physical sensations of anxiousness than I am used to.
- I understand that I can withdraw both myself from participation and my data from the project up to two weeks after participation.
- I understand that data recorded in paper form will be stored in a locked filing cabinet or a secure computer for computer files. This data will be stored

separately from this consent form which will be stored in Associate Professor Linda Cameron's office at the University of Auckland Tamaki campus for a period of six years.

- I understand that data collected from participants will remain confidential and anonymity will be protected where possible, but that since some of the research will be conducted in group settings absolute anonymity can not be guaranteed.
- I understand that my identity will not be disclosed in any reports about the study.

I would like to receive a summary of the results of the research. Y / N

NAME:

SIGNED:

DATE:

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 5/12/07 for 3 years on 5/12/07 to 5/12/10 Reference Number 2007/388

APPENDIX M1
Handbook: Mindfulness



MINDFULNESS



MANAGING ANXIETY

Many people find they feel anxious in social situations, such as parties or classrooms. This is usually worse when they are expected to interact with people they don't know well. It is also common for people to feel worried about situations in which they will have to perform in front of people, such as giving a speech or a class presentation. Sometimes feeling worried or anxious about these situations can make it hard to perform well or interact socially. Fortunately it is possible to learn strategies to help manage these feelings and perform better in these types of situations.

We tend to have habitual ways of thinking and behaving when we feel anxious that can perpetuate our anxiety. For example, if we are feeling anxious about speaking in front of a group of people our heart rate will increase. Noticing this, we might think to ourselves 'I'm really nervous about this, I'm not going to be able to do a good job'. Thinking this makes us feel more anxious about the upcoming speech and as this increases our hands might become sweaty or start to tremble. We might think 'I'm so nervous, everyone will be able to tell, and they'll think I'm stupid' and try and hide our anxiety by speaking softly with our head down, looking at the ground.

In this situation our thoughts and behaviours were probably a habitual response to feelings of anxiety. But they actually exacerbated our anxiety and led to a poorer performance on the speech. One way to manage feelings of stress and anxiety is to become more aware of these kinds of habitual responses. By doing this we can respond to situations and feelings in a less automatic way and break out of the cycle of anxious thoughts and behaviours.

DEVELOPING AWARENESS

From time to time we all experience the effects of absent mindedness. We may read a whole page of a book and find that we have taken in nothing. Similarly we can sometimes drive for miles on 'automatic pilot' without really being aware of what we are doing. In the same way we may not be really 'present' moment-by-moment for much of our lives: We can often be miles away without knowing it. When we are in this mode, events around us, and thoughts, feelings and sensations in the mind can trigger old habits of thinking that are unhelpful and may lead to our becoming anxious (Segal et al., 2002).

If you start paying attention to where your mind is from moment to moment throughout the day, chances are you will find that considerable amounts of time and energy are expended in clinging to memories, being absorbed in reverie, and regretting things that have already happened and are over. And you will probably find that as much or more energy is spent anticipating, planning, worrying and fantasizing about the future and what you want to happen or don't want to happen. When the mind is dominated by dissatisfaction and unawareness in this way it is difficult to feel calm and we are more likely to feel anxious (Kabat-Zinn, 2006). In addition when we are fixated on the past or future we may also 'miss out' on valuable experiences or observations in the present that disconfirm our anxious thoughts. For example we might not notice cues or feedback from people that what we are saying is better received than we thought.



By becoming more aware of our thoughts, feelings, and body sensations from moment to moment we give ourselves the chance to respond to situations with choice rather than react automatically (Segal et al., 2002). We also discover three things about our experience that can help us feel less anxious. Firstly we start to see that our thoughts and feelings are **only** thoughts and feelings. We learn that they are not necessarily reflections of reality or an integral part of who we are. Secondly we discover that thoughts and feelings are impermanent, we learn this by watching them ebb and flow through our experience. Finally understanding these aspects of our thoughts and feelings means we are more able to face some of the distressing aspects of our experience we typically avoid. It is easier to do this when we know they are not real, not 'us', and not permanent. By facing these things they typically become less distressing. We can make these discoveries by practicing being more aware of where our attention is and deliberately changing the focus of attention over and over again. We do this by using our attention to our breathing to anchor our awareness in the moment with a technique called **mindful breathing** (Segal et al., 2002).

Doing something in a 'mindful' way is the opposite of being on automatic pilot. Mindfulness means paying attention in a particular way, on purpose, in the present moment and non-judgmentally. It is the process of observing body and mind intentionally, of letting your experience unfold from moment to moment. It does not involve rejecting your thoughts nor trying to clamp down on them or suppress them, nor trying to control anything at all other than the focus and direction of your attention. However, it is natural for thoughts to wander sometimes and if your mind wanders from your focus of attention (e.g. your breath), your task is not to chastise yourself for failing to 'control' your thoughts; it is rather to note in a neutral manner that the mind has wandered, perhaps where it has wandered to, and to return to your focus.

ACCEPTANCE

It is important to develop a stance of **accepting** experience without judging. This aspect of mindfulness practice is just as important as learning to direct our attention at the present, rather than the past or future. As you become more aware of your thoughts and feelings about the things you experience you will probably notice that you frequently judge your experience and categorise particular events, thoughts, feelings and people as either good because they make you feel good for some reason, or bad because for some reason this is how they make you feel. We tend to respond to these judgments reactively, even though these reactions may have no objective basis beyond our own judgement (Kabat-Zinn, 2006).

This tendency to judge our experience as being not quite right in some way, that it is not what should be happening, not good enough or not what we expected or wanted, is one of the influences taking us away from being present and aware in each moment. This takes away the freedom to choose what, if any, action needs to be taken. We can regain our freedom if we simply acknowledge the actuality of our situation without being hooked into automatic tendencies to judge, blame, fix, or want things to be other than they are.

Practicing mindfulness provides us with an opportunity to practice simply bringing an interested and friendly awareness to the way things are in each moment without having to



do anything to change them (Segal et al., 2002). We might call this bringing a quality of 'kindness' to our awareness. Such an accepting approach may over time alert us to the truth that, either the actuality is not as bad as we thought, or it may make us calmer and thus more objective in seeing what action needs to be taken to improve things.

THE TECHNIQUE

Mindful breathing

Settle into a comfortable sitting position, either on a straight backed chair or on a soft surface on the floor, supported by cushions or a low stool. If you use a chair, it is very helpful to sit away from the back of the chair so that your spine is self supporting. If you sit on the floor, it is helpful if your knees actually touch the floor; experiment with the height of the cushions or stool until you feel comfortably and firmly supported.

Allow your body to adopt an alert, dignified, and comfortable posture. The back should be upright but not stiff, and aligned with the neck and the head. Shoulders are relaxed and the chin is tucked in a little. If sitting on a chair, place your feet flat on the floor with your legs uncrossed. Gently close your eyes. If you are very tired and concerned about drifting off, you may keep your eyes open but softly focussed on a particular object in front of you.

Bring your awareness to the level of physical sensations by focussing your attention on the sensations of touch and pressure in your body where it makes contact with the floor and whatever you are sitting on.

When you are ready, become aware of the fact that you are breathing. Bring your awareness to the changing patterns of physical sensations in the lower abdomen as the breath moves in and out of your body. Alternatively you can bring your attention to the passage of air through the nostrils, or anywhere else that the breath sensations are accessible and vivid for you. Just feel the breath coming into the body and leaving the body. Follow the breath sensations as best you can with your full attention moment by moment and breath by breath

As best you can, follow with your awareness the full duration of each breath coming into the body on the in breath and leaving the body on the out breath, perhaps noticing the slight pauses between one in breath and the following out breath, and between one out breath and the following in breath.

It's best if you can stay with the breath in a particular location in the body for the full duration of a practice period, so if you start with the abdomen or the nostrils then the suggestion is to stay with the sensations in that area, cultivating a greater stability of attention.

There is no need to try and control the breathing in anyway- simply let the breath breathe itself. As best you can, also bring this attitude of allowing to the rest of your experience. There is nothing to be fixed, no particular state to be achieved. As best you can simply allow your experience to be your experience, without needing it to be other than it is.



Sooner or later your mind will wander away from the focus on the breath in the lower abdomen to thoughts, planning, daydreams, drifting along- whatever. This is perfectly OK- it is simply what minds do. It is not a mistake or a failure. When you notice that your awareness is no longer on the breath, gently congratulate yourself. You have come back and are once more aware of your experience.

Whenever you find your mind has wandered, notice what is on your mind in that moment, whatever it is, and then gently let go of it. This doesn't mean pushing it away, just recognise it, and let it be, as you escort your attention back to the breath, renewing the intention to pay attention to the ongoing in breath or out breath, whichever you find.

However often you notice that the mind has wandered (and this will quite likely happen over and over again), as best you can, congratulate yourself each time on reconnecting with your experience in the moment, and gently escort your attention back to the breath, once again following with awareness the changing pattern of physical sensations that come with each in breath and each out breath.

Without being harsh or critical or judging of yourself, simply recognise what is arising for what it is and let it be. Come back to feeling this breath in this moment, and begin again and again. Each time for the first time, each moment the only moment, since our lives are unfolding here and now and only here and now, no matter what our thoughts are telling us.

As best you can bring the quality of kindness to your awareness, perhaps seeing the repeated wanderings of the mind as opportunities to bring patience and gentle curiosity to your experience.

Since it is in the nature of the mind to wander it's not that you are failing at meditation if your mind doesn't stay on the breath. It's that you are discovering something exceedingly important about the nature of the mind itself. And that is, that it waves, just as the ocean waves. So it's never a matter of putting a stop to it, trying to shut off your thinking or make your mind go blank. But rather familiarising yourself with the nature and the ways of your own mind, grounded in an awareness that is wiser than thinking, which grows out of our bringing the mind back to the breath over and over, allowing each in breath to be a new beginning and each out breath a complete letting go (Segal et al., 2002; Williams, Teasedale, Segal, & Kabat-Zinn, 2007).

TIPS FOR IMPLEMENTING THE TECHNIQUE

There is no goal to be achieved other than to bring awareness to our breath moment-by-moment. Regardless of what happens (e.g., if you fall asleep, lose concentration, or keep thinking of other things) keep going! These are your experiences in the moment. Just be aware of them. If your mind is wandering a lot, simply note the thoughts (as passing events) and bring the mind back to the breath. Let go of ideas of success, failure or doing it really well. This is not a competition. It is not a skill for which you need to strive. The only discipline involved is regular and frequent practice. Just do it with an attitude of openness and curiosity. Try and approach your experience in each moment with the attitude: "OK, that's just the way things are right now." If you try to fight



unpleasant thoughts, feelings or body sensations, the upsetting feelings will only distract you from doing anything else. Accept things as they are (Segal et al., 2002).

USING MINDFULNESS TO MANAGE ANXIETY

We can apply the same attitude that we adopt when we are practicing mindful breathing to other situations and experiences including social or performance situations. By reminding ourselves to be open and accepting of our experience moment by moment; and remembering to refrain from judging our experience as much as possible we can remain more centred and focussed in these situations. By doing this we are less likely to begin reacting (usually thinking or behaving) in ways that lead to us feeling more anxious.

We can also bring the mindful breathing exercise directly into anxiety provoking situations to help us become centred and focussed. If you find yourself in one of these situations try focussing your attention on your breath for a few moments, accept any anxious or unwelcome thoughts but then switch your attention to the person or people you are interacting with. Mindfully focus your attention outwards. As much as possible use the same kind of attention and attitude you have been directing at your breath. This means it is important to remain present to the interaction without getting caught up in thoughts and judgements about the other person or yourself.

As with the breathing technique itself it is important to practice this regularly. You can even practice it in situations that don't make you feel particularly anxious. With regular practice this way of interacting will become more natural and you will be able to use it in a variety of situations in which you might previously have felt anxious.

DAILY MINDFULNESS

It is also helpful if you can practice introducing this attitude of mindfulness to other daily activities.

- When you first wake up in the morning before you get out of bed bring your attention to your breathing and observe five mindful breaths.
- Whenever you hear phone ring, a bird sing, a train pass, laughter or any other sound use this as the bell of mindfulness and practice bringing your attention to the sound in the same way you do to your breathing. Really listen and be present and awake
- Whenever you eat or drink something take time to see, smell and taste food with the same attention you direct to your breathing.
- Similarly pay more attention to your other senses like seeing, smelling and touch by purposely taking a few moments to stop **thinking** about what you can see, smell or feel to instead experience them **directly**.
- Throughout the day take a few moments to bring your attention to your breathing. Observe five mindful breaths.
- Focus your attention on daily tasks such as doing the dishes or brushing your teeth.
- Take 5 mindful breathes before going to sleep at night (Segal et al., 2002).



THE IMPORTANCE OF PRACTICE

The patterns of mind that we are working to change have been around for a long time. The success of this approach depends entirely on your willingness to practice for 15 minutes each day for the next 4 weeks. In doing so you are cultivating a level of awareness that will promote calmness and focus in your daily life and better enable you to manage anxiety (Segal et al., 2002). The final two pages of this handbook contain a practice log. Please record the amount of time you spend practicing this technique each day for the next four weeks and bring the log along to our final session. *Thank you!*

REFERENCES

- Kabat-Zinn, J. (2006). *Full Catastrophe Living. How to cope with stress, pain and illness using mindfulness meditation*. London: Piatkus Books Ltd.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-Based Cognitive Therapy for Depression*. New York: The Guilford Press.
- Williams, J. M. G., Teasdale, J. D., Segal, Z. V., & Kabat-Zinn, J. (2007). *The mindful way through depression*. New York: The Guilford Press.



PRACTICE LOG

Week one

<i>Date</i>	<i>Practice duration</i>	<i>Comments</i>

Week two

<i>Date</i>	<i>Practice duration</i>	<i>Comments</i>

Participant code: _____



PRACTICE LOG

Week three

<i>Date</i>	<i>Practice duration</i>	<i>Comments</i>

Week four

<i>Date</i>	<i>Practice duration</i>	<i>Comments</i>

Participant code: _____

APPENDIX M2
Handbook: Relaxation



RELAXATION



MANAGING ANXIETY

Many people find they feel anxious in social situations, such as parties or classrooms, where they are expected to interact with people they don't know well. It is also common for people to feel worried about situations in which they will have to perform in front of people, such as giving a speech or a class presentation. Sometimes feeling worried or anxious about these situations can make it hard to perform well or interact socially. As a result people are often keen to learn strategies to help them manage their feelings and perform better in these types of situations.

Feelings of anxiety are often accompanied by physical tension in the body. These feelings of tension are part of a system of experiences we often have when we feel anxious. For example if we are anxious about an upcoming speech we might also feel tense, nervous, stressed and scared. We might have thoughts like 'I'm no good at public speaking', 'everyone will think I sound stupid' and we might behave in a way that is compatible with these thoughts and feelings. For example we might speak softly and lower our head when we speak. By learning to reduce the amount of tension in our body and physically relax we are changing one aspect of this system (physical tension) and this often triggers changes in the rest of this system. We might begin to have less negative thoughts and feelings about public speaking and as a result speak with more confidence. This is called the 'relaxation response'. By practicing the physical aspect of relaxation and reducing tension we can train our minds and bodies to enter the relaxation response more readily when we need them to.

LEARNING TO RELAX

Progressive muscle relaxation training consists of learning to tense and then relax various groups of muscles all through the body, while at the same time paying very close and careful attention to the feelings associated with both tension and relaxation. That is, in addition to teaching you how to relax I will also be encouraging you to learn to recognize and pinpoint tension and relaxation as they appear in everyday situations. You may be wondering why, if we want to produce relaxation we start off by producing tension. The reason is that everyone is always at some level of tension during waking hours; if people were not tense to some extent, they would simply fall down. The amount of tension actually present in everyday life differs from individual to individual, and we say that each person has reached some "adaptation level"- the amount of tension under which he or she operates day to day. The goal of progressive relaxation training is to help you learn to reduce muscle tension in your body far below your adaptation level at any time you wish to do so. The best way to do this is to produce a good deal of tension in the muscle group (to raise the tension well above the adaptation level) and then all at once to release that tension. The release creates a momentum which allows the muscles to drop well below the adaptation level. Another important advantage to creating and releasing tension is that it will give you a good chance to focus your attention upon and become clearly aware of what tension really feels like in each of the various groups of muscles. In addition, the tensing procedure will give you an excellent opportunity to directly compare the two and appreciate the difference in feeling associated with each of these states (Bernstein, 2000).



THE TECHNIQUE

Progressive Relaxation

Sit in a comfortable reclining chair or lie on a soft bed. Be sure that the room you are in is quiet and free from interruptions. It is a good idea to have a blanket with you since your body temperature may drop dramatically during relaxation.

Progressive relaxation involves focussing your attention on one muscle group at a time. Please pay attention only to what I am saying and the sensations in that muscle group, allowing the rest of your body to remain relaxed. When I ask you to tense a muscle group, I will say, for example, "Tense the muscles in your forehead by raising your eyebrows, now." "Now" will be the cue word for you to tense your muscles. Do not tense the muscles until I say "now". When I want you to relax a muscle group, I will say "Relax the muscles in your forehead." When I say that, let all the tension go all at once, not gradually. This allows the muscles to relax more deeply. Try not to move any more than is necessary to remain comfortable. In order to gain the maximum benefit from relaxation, it is preferable not to move any muscles that have already been relaxed. This prevents tension from reappearing in those muscles (Bernstein & Given, 1984).

1. Focus all of your attention on the muscles of your right hand and lower arm. Tense these muscles by making a tight fist now. You should be able to feel tension in the hand, over the knuckles, and up to the lower arm.

Relax these muscles and concentrate on the pleasant sensations of relaxation in your right hand and forearm. (30 seconds)

2. Focus all of your attention on the muscles of your left hand and lower arm. Tense these muscles by making a tight fist now. Once again you should be able to feel tension in the hand, over the knuckles, and up to the lower arm.

Relax the muscles in your left hand and lower arm. Let all the tension go, focussing on these muscles as they just relax completely (30 seconds)

3. Focus your attention on the muscles in your right bicep. Tense these muscles by pushing your elbow against the chair or bed now. You should be able to get a feeling of tension in the biceps without involving the muscles in the lower arm or hand.

Relax, focussing all of your attention on the feelings of relaxation flowing into this area. (30 seconds)

4. Focus your attention on the muscles in your left bicep. Once again, tense these muscles by pushing your elbow against the chair or bed now.

Relax. There is nothing for you to do but focus your attention on the pleasant feelings of relaxation flowing into this area. (30 seconds)

5. Focus your attention on the muscles in your forehead area. Tense these muscles by lifting your eyebrows as high as you can now. You should be able to feel tension in your forehead and up into the scalp region.



Relax and release this tension. Just experience the sensations of deep complete relaxation flowing into these muscles. (30 seconds)

6. Focus your attention on the muscles in the central part of your face, around the upper part of your cheeks. Tense these muscles by squinting your eyes very tightly and wrinkling up your nose at the same time now. You should be able to feel tension around your eyes and upper parts of your cheeks.

Relax and let all the tension go, focussing on these muscles as they just relax completely (30 seconds)

7. Focus your attention on the muscles in the lower part of your face. Tense these muscles by biting your teeth together and pulling the corners of your mouth back now. You should feel tension all through the lower part of your face and in your jaw.

Relax, focussing all of your attention on the feelings of relaxation flowing into this area. (30 seconds)

8. Focus on the muscles in your neck and throat. Tense these muscles by pulling your chin downwards towards your chest and at the same time try to prevent it from actually touching your chest. Do this now. You should feel just a little bit of shaking or trembling in these muscles.

Relax and release this tension noticing what it feels like as these muscles go on and on relaxing. (30 seconds)

9. Focus your attention on the muscles of your chest, shoulders and upper back. Tense these muscles by taking a deep breath, holding it and at the same time pulling your shoulder blades together; that is pull your shoulders back and try to make the shoulder blades touch. Do this now. You should feel significant tension in your chest, shoulders and upper back.

Now relax and enjoy the feelings in these muscles as they loosen up, smooth out, unwind, and relax more and more deeply. (30 seconds)

10. Focus on the muscles in your abdomen. Tense your abdominal muscles by making your stomach go hard, as though you are trying to push your stomach muscles in and out at the same time. Do this now. You should feel a good deal of tension and tightness in the stomach area.

Now relax. Release these muscles and concentrate on the pleasant sensations of relaxation in you abdomen. (30 seconds)

11. Focus your attention on your right thigh. Tense these muscles by counter posing the large muscle on top of the leg with the two smaller ones underneath; you should be able to feel that large top muscle get quite hard. Do this now.

Relax. Focus all of your attention on the feelings associated with relaxation flowing in to these areas. (30 seconds)



12. Focus your attention on the muscles of the right calf and lower leg. Tense these muscles by pulling your toes upwards towards your head. You should be able to feel tension all through the calf area. Do this now.

Relax and let all the tension go, focussing on these muscles as they just relax completely (30 seconds)

13. Focus your attention on the muscles in your right foot. Tense these muscles by pointing your toe turn your foot inward and at the same time curl your toes. Do this now. Don't tense these muscles very hard, just enough to feel the tightness under the arch and in the ball of the foot.

Now relax and enjoy the feelings in these muscles as they loosen up, smooth out, unwind, and relax more and more deeply. (30 seconds)

14. Now focus your attention on your left thigh. Tense these muscles by counter posing the large muscle on top of the leg with the two smaller ones underneath. Do this now.

Relax. Release these muscles and concentrate on the pleasant sensations of relaxation in you thigh. (30 seconds)

15. Focus your attention on the muscles of the left calf and lower leg. Tense these muscles now by pulling your toes upwards towards your head.

Relax and release this tension. Just experience the sensations of deep complete relaxation flowing into these muscles. (30 seconds)

16. Focus your attention on the muscles in your left foot. Tense these muscles now by pointing your toe, turn your foot inward and at the same time curl your toes.

Relax. There is nothing for you to do but focus your attention on the pleasant feelings of relaxation flowing into this area. (30 seconds)

Continue to allow these muscles to relax and enjoy the pleasant feelings of relaxation as they go on and on relaxing. Just experience the sensations of deep, complete relaxation. Calm, peaceful and relaxed. (3 minutes)

Now count backward from 4 to 1. On the count of 4, begin to move your legs and feet; on the count of 3, move your arms and hands; on the count of 2, move your head and neck; and on the count of 1 open your eyes, feeling quite calm and relaxed, just as if you've had a brief nap .

APPLIED RELAXATION

Using your relaxation skill effectively during the day to eliminate tension and anxiety will depend on your learning to catch the very early beginnings of bodily and mental cues indicating that you are becoming anxious. The sooner you can catch a beginning cue, and the sooner you respond with relaxing that cue away, the less anxiety will develop during the day.



- Once an hour, on the hour, stop whatever you are doing and attend to what your body and mind are doing. Identify any feelings of tension, any sensations of anxiety, and any distressing thoughts, then briefly let go of those feelings or thoughts; relax them away. Then continue with whatever you were doing.
- Every time you change activities (e. g., when you take a break from some task, when you change tasks, when you first move to a different location), do the same thing, check out your body and mind and relax away any signs of anxiety. Just become aware of the frequent beginnings of new activities or events in your day and relax yourself when you first enter the new situation or activity.
- Any time you notice feelings of tension and anxiety or the beginnings of a worry or other distressing thoughts, practice letting go of them and relaxing them away (Bernstein, 2000).

THE IMPORTANCE OF PRACTICE

Learning relaxation skills is very much like learning any other kind of skill such as swimming, or golfing, or riding a bicycle; that is, in order for you to get better at relaxing you will have to practice doing it just as you would have to practice other skills. Thus, without practicing these skills each day for the next 4 weeks they are unlikely to be effective (Bernstein, 2000). The final two pages of this handbook contain a practice log. Please record the amount of time you spend practicing this technique each day for the next four weeks and bring the log along to our final session. *Thank you!*

REFERENCES

- Bernstein, D. A. (2000). *New Directions in Progressive Relaxation Training: a Guidebook for Helping Professionals*. Westport: Greenwood Publishing Group Inc.
- Bernstein, D. A., & Given, B. A. (1984). Progressive relaxation: Abbreviated methods. In R. L. Woolfolk & P. M. Lehrer (Eds.), *Principles and practice of stress management*. New York: The Guilford Press.



PRACTICE LOG

Week one

<i>Date</i>	<i>Practice duration</i>	<i>Comments</i>

Week two

<i>Date</i>	<i>Practice duration</i>	<i>Comments</i>

Participant code: _____



PRACTICE LOG

Week three

<i>Date</i>	<i>Practice duration</i>	<i>Comments</i>

Week four

<i>Date</i>	<i>Practice duration</i>	<i>Comments</i>

Participant code: _____

APPENDIX N1 Mindfulness Teaching Protocol

There is lot of information to convey. Please feel free to stop me and ask questions or seek clarification. Alternatively you can always email me after this session if you have any questions. There truly are no stupid questions. It is more important that you can understand and make sense of what I am saying in a way that is meaningful to you.

Managing Anxiety

- Anxiety in social and performance situations is common. Provide examples
- Feeling anxious can impact performance. Provide examples
- Finding ways to manage our anxiety therefore not only helps us feel better but it can also help us perform better.

Anxious responses can be habitual

- Provide example.
- These responses are probably habitual (e.g. we often have a similar response in similar situations) and thoughts, behaviours, and memories exacerbated anxiety and impacted performance.
- By becoming more aware of these habitual responses can then respond to situations and feelings in a less automatic way. **Pause – Questions?**

Mindfulness is about developing awareness

- Start by understanding Un-awareness/ automatic pilot
- Absent mindedness: Ask for examples.
- Where are we when we are miles away? Often focussing on what we do or don't want to happen.
- Why is this problem? How does being more aware help?
 - Awareness enables us to react with choice.
 - Dissatisfaction makes it difficult to feel calm and more likely we will feel anxious
 - 'Miss out' on observations in the present that disconfirm our anxious thoughts.
 - Awareness of our thoughts and feelings also helps us discover three important things that can help us feel less anxious.
 - Thoughts and feelings are only thought and feelings. Thoughts are not reality
 - Thoughts and feelings are impermanent, we learn this by watching them arise and subside.
 - Knowing thoughts and feelings don't necessarily convey reality, and that they are not permanent means we are more able to face things we might otherwise avoid and by facing these things they often become less distressing. **Pause – Questions?**

How do we become more aware?

- By being more aware of where our attention is and deliberately changing the focus of attention over and over again. Attention training
- Attention to our breathing anchor our awareness in the moment mindful breathing (Segal et al., 2002).
- Technique will spill over eventually. Gain more control we can direct our attention to any number of things. **Pause – Questions?**

What is mindfulness?

- Being mindful is the opposite of automatic pilot. Mindfulness means paying attention in a particular way, on purpose, in the present moment and nonjudgmentally. It is the process of observing body, mind and experience intentionally, **and also** of letting your experience unfold from moment to moment.
- Not rejecting thoughts or suppressing them. Only controlling the focus and direction of our attention.
- We are not trying to make our minds go blank. It is normal to think and it is *natural and normal* for thoughts to wander sometimes. **Pause – Questions?**

The importance of acceptance

- It is important to develop a stance of accepting experience without judging. This is just as important as learning to direct our attention at the present, rather than the past or future. Why?
 - Much of our experience is shaped by our judgements
 - Judging is one of the influences taking us away from being aware and in each moment. These judgments can lead to more habitual sequences of thoughts e.g., about what needs to be changed.
 - Judgements are normal (the brain is more or less designed to categorise our experiences) but it is our reactions to these that can be problematic. We tend to respond to these judgments as though they are fact.
 - Practicing mindfulness provides us with an opportunity to practice simply bringing an interested and friendly awareness to the way things are in each moment without having to do anything to change things (Segal et al., 2002). We might call this bringing a quality of ‘kindness’ to our awareness. **Pause – Questions?**

Practice mindful breathing technique

Tips for implementing the technique

- No goal to be achieved other than to bring awareness to your breath moment-by moment. Regardless of what happens (e.g., if you fall asleep, lose concentration, or keep thinking of other things) keep going! These are your experiences in the moment. Just be aware of them.

- Let go of ideas of success, failure or doing it really well. This is not a competition. It is not a skill for which you need to strive. The only discipline involved is regular and frequent practice.
- Just do it with an attitude of openness and curiosity. Try and approach your experience in each moment with the attitude: “OK, that’s just the way things are right now.” If you try to fight unpleasant thoughts, feelings or body sensations, the upsetting feelings will only distract you from doing anything else. Accept things as they are (Segal et al., 2002). **Pause – Questions?**

Using mindfulness to manage anxiety

- We can apply the same attitude that we adopt when we are practicing mindful breathing to other situations including social or performance situations. By reminding ourselves to be open and accepting of our experience moment by moment; and remembering to refrain from judging our experience as much as possible we can remain more centred and focussed in these situations. By doing this we are less likely to begin reacting in ways that lead to us feeling more anxious.
- We can also bring the mindful breathing exercise directly into anxiety provoking situations to help us become centred and focussed.
 - Try focussing your attention on your breath for a few moments, accept any anxious or unwelcome thoughts then switch attention to the person or people you are interacting with. As much as possible use the same kind of attention and attitude you have been directing at your breath. This means it is important to remain present to the interaction without getting caught up in thoughts and judgements about the other person or yourself.
- As with the breathing technique itself it is important to practice regularly. You can even practice it in social situations that don’t make you feel particularly anxious. **Pause – Questions?**

Daily mindfulness

- It is also helpful if you can practice introducing this attitude of mindfulness to other daily activities.
 - When you first wake up in the morning before you get out of bed bring your attention to your breathing and observe five mindful breaths.
 - Throughout the day take a few moments to bring your attention to your breathing. Observe five mindful breaths.
 - Focus your attention on daily tasks such as doing the dishes or brushing your teeth.
 - Take 5 mindful breathes before going to sleep at night (Segal et al., 2002).
 - Think about how you can develop your technique in a way that is portable for you.

Practice

- The patterns of mind that we are working to change have been around for a long time.
- The success of this approach depends entirely on your willingness to practice for 15 minutes each day for the next 4 weeks. (Segal et al., 2002).

- The final two pages of this handbook contain a practice log. Please record the amount of time you spend practicing this technique each day for the next four weeks and bring the log along to our final session.
- When will you practice? It's a good idea to think now about when might be a good time morning, after uni, before bed? What might get in the way, how will you get past this?
- CD's will load on to iPod, MP3 players.
- Please practice with CD rather than on your own. Standardizes the research.
- If you don't get a chance to practice for some reason you might want to note down the reason why in the comments section.
- For the purposes of this research I'm going to ask you to practice every day but if for someone reason you don't practice one day or even at all it is really important that you are honest about this on the practice log, because if you are not this could really ruin my results. I won't be upset or angry if you don't practice as much as I ask, it's just important to be honest, and to help you feel more comfortable about being honest I will bring a box along to our next session and you can drop your practice log into this anonymously. **Questions?**

APPENDIX N2

Relaxation Teaching Protocol

There is a lot of information to convey. It may or may not be new to you. Please feel free to stop me and ask questions or seek clarification. Alternatively you can always email me after this session if you have any questions. There truly are no stupid questions. It is more important that you can understand and make sense of what I am saying in a way that is meaningful to you.

Managing anxiety

- Anxiety in social and performance situations is common. Provide examples
- Feeling anxious can impact performance. Provide examples
- Finding ways to manage our anxiety therefore not only helps us feel better but it can also help us perform better.

Feelings of anxiety are often accompanied by physical tension in the body

- Provide example
- By learning to reduce the amount of tension in our body and physically relax we can reduce this physical discomfort and better manage feelings of stress and anxiety. **Pause – Questions?**

Learning to relax

- Progressive muscle relaxation training consists of learning to tense and then relax various groups of muscles all through the body.
- Also paying very close and careful attention to the feelings associated with both *tension* and *relaxation*.
- As well as learning how to relax I will also be encouraging you to learn to recognize and pinpoint tension and relaxation as they appear in everyday situations.
- Why do we learn to relax by producing tension first?
- Everyone is always at some level of tension during waking hours (this is necessary to stop us falling down).
- The amount of tension actually present varies from individual to individual, and we say that each person has reached some “adaptation level”- the amount of tension under which he or she operates day to day.
- The goal of progressive relaxation training is to help you learn to reduce muscle tension in your body far below your adaptation level at any time you wish to do so. The best way to do this is to produce a tension in the muscle group (to raise the tension well above the adaptation level) and then all at once to release that tension. This creates a *momentum* which allows the muscles to drop well below the adaptation level.
- Also gives you a good chance to focus your attention on and become clearly aware of what tension really feels like in each of the various groups of muscles. This gives you an excellent opportunity to directly compare relaxation and tension and appreciate the difference in feeling associated with each of these states (Bernstein, 2000). **Pause – Questions?**

Practice progressive relaxation technique

Applied relaxation

- Using your relaxation skill effectively during the day to eliminate tension and anxiety will depend on your learning to catch the very early beginnings of bodily and mental cues indicating that you are becoming anxious. The sooner you can catch a beginning cue, and the sooner you respond with relaxing that cue away, the less anxiety will develop during the day.
 - Once an hour, on the hour, stop whatever you are doing and attend to what your body and mind are doing. Identify any feelings of tension, any sensations of anxiety, and any distressing thoughts, then briefly let go of those feelings or thoughts; relax them away. Then continue with whatever you were doing.
 - Every time you change activities (e. g., when you take a break from some task, when you change tasks, when you first move to a different location), do the same thing, check out your body and mind and relax away any signs of anxiety. Just become aware of the frequent beginnings of new activities or events in your day and relax yourself when you first enter the new situation or activity.
 - Any time you notice feelings of tension and anxiety or the beginnings of a worry or other distressing thoughts, practice letting go of them and relaxing them away (Bernstein, 2000).
 - Think about how you can develop your technique in a way that is portable for you. **Pause – Questions?**

Practice

- Learning relaxation skills is very much like learning any other kind of skill such as swimming, or golfing, or riding a bicycle; that is, in order for you to get better at relaxing you will have to practice doing it just as you would have to practice other skills.
- Thus, without practicing these skills each day for the next 4 weeks they are unlikely to be effective.
- The final two pages of this handbook contain a practice log. Please record the amount of time you spend practicing this technique each day for the next four weeks and bring the log along to our final session.
- It's a good idea to think now about when might be a good time morning, after uni, before bed?
- CD's will load on to iPod, MP3 players.
- Please practice with CD rather than on your own. Standardizes the research.
- If you don't get a chance to practice for some reason you might want to note down the reason why in the comments section.
- For the purposes of this research I'm going to ask you to practice every day but if for someone reason you don't practice one day or even at all it is really important that you are honest about this on the practice log, because if you are not this could really ruin my results. I won't be upset or cross if you don't practice as much as I ask, its just important to be honest, and to help you feel more comfortable about being honest I will bring a box along to our next session and you can drop your practice log into this anonymously. **Questions?**

APPENDIX O
Social Avoidance and Distress Scale

Please read the statements below and think carefully about whether or not they apply to you. If you think a statement does apply to you circle T for true. If you do not think a statement applies to you circle F for false. Please provide an answer for every statement. If you cannot decide whether a statement does or does not apply to you circle F for false.

- | | | | |
|---|---|-----|--|
| T | F | 1. | I feel relaxed even in unfamiliar social situations. |
| T | F | 2. | I try to avoid situations which force me to be very sociable. |
| T | F | 3. | It is easy for me to relax when I am with strangers. |
| T | F | 4. | I have no particular desire to avoid people. |
| T | F | 5. | I often find social occasions upsetting. |
| T | F | 6. | I usually feel calm and comfortable at social occasions. |
| T | F | 7. | I am usually at ease when talking to someone of the opposite sex. |
| T | F | 8. | I try to avoid talking to people unless I know them well. |
| T | F | 9. | If the chance comes to meet new people I often take it. |
| T | F | 10. | I often feel nervous or tense in casual get-togethers in which both sexes are present. |
| T | F | 11. | I am usually nervous with people unless I know them well. |
| T | F | 12. | I usually feel relaxed when I am with a group of people. |
| T | F | 13. | I often want to get away from people. |
| T | F | 14. | I usually feel uncomfortable when I am in a group of people I don't know. |
| T | F | 15. | I usually feel relaxed when I meet someone for the first time. |
| T | F | 16. | Being introduced to people makes me tense and nervous. |
| T | F | 17. | Even though a room is full of strangers I may enter it anyway. |
| T | F | 18. | I would avoid walking up and joining a large group of people. |
| T | F | 19. | When my superiors want to talk with me, I talk willingly. |
| T | F | 20. | I often feel on edge when I am with a group of people. |
| T | F | 21. | I tend to withdraw from people. |
| T | F | 22. | I don't mind talking to people at parties or social gatherings. |
| T | F | 23. | I am seldom at ease in a large group of people. |
| T | F | 24. | I often think up excuses in order to avoid social engagements. |

- T F 25. I sometimes take the responsibility for introducing people to each other.
- T F 26. I try to avoid formal social occasions.
- T F 27. I usually go to whatever social engagement I have.
- T F 28. I find it easy to relax with other people.

APPENDIX P
Anxiety Symptoms Ratings

How anxious are you feeling right now?

not at all										extremely
0	1	2	3	4	5	6	7	8	9	10

To what extent are you experiencing the following?

	not at all										extremely
Racing heart	0	1	2	3	4	5	6	7	8	9	10
Blushing	0	1	2	3	4	5	6	7	8	9	10
Sweaty palms	0	1	2	3	4	5	6	7	8	9	10
Shortness of breath	0	1	2	4	4	5	6	7	8	9	10

APPENDIX Q
Rumination Reflection Questionnaire – Rumination Subscale

Please indicate the extent to which you agree or disagree with the following statements.

	strongly disagree	disagree	neutral	agree	strongly agree
1. My attention is often focussed on aspects of myself I wish I'd stop thinking about.	1	2	3	4	5
2. I always seem to be rehashing in my mind recent things I've said or done.	1	2	3	4	5
3. Sometimes it is hard for me to shut off thoughts about myself	1	2	3	4	5
4. Long after an argument or disagreement is over with, my thoughts keep going back to what has happened.	1	2	3	4	5
5. I tend to "ruminate" or dwell over things that happen to me for a really long time afterward.	1	2	3	4	5
6. I don't waste time rethinking things that are over and done with. (r)	1	2	3	4	5
7. Often I'm playing back over in my mind how I acted in a past situation.	1	2	3	4	5
8. I often find myself re-evaluating something I've done.	1	2	3	4	5
9. I never ruminate or dwell on myself for very long. (r)	1	2	3	4	5
10. It is easy for me to put unwanted thoughts out of my mind. (r)	1	2	3	4	5
11. I often reflect on episodes in my life that I should no longer concern myself with.	1	2	3	4	5
12. I spend a great deal of time thinking back over my embarrassing or disappointing moments.	1	2	3	4	5

(r) = reverse scored items

APPENDIX R
White Bear Suppression Inventory

Please indicate the extent to which you agree or disagree with the statements below.

	Strongly	Agree	Neither agree	Disagree	Strongly
1. There are things that I prefer not to think about.	1	2	3	4	5
2. Sometimes I wonder why I have the thoughts I do.	1	2	3	4	5
3. I have thoughts that I cannot stop.	1	2	3	4	5
4. There are images that come to mind that I cannot erase.	1	2	3	4	5
5. My thoughts frequently return to one idea.	1	2	3	4	5
6. I wish I could stop thinking of certain things.	1	2	3	4	5
7. Sometimes my mind races so fast I wish I could stop it.	1	2	3	4	5
8. I always try to put problems out of mind.	1	2	3	4	5
9. There are thoughts that keep jumping into my head.	1	2	3	4	5
10. Sometimes I stay busy just to keep thoughts from intruding on my mind.	1	2	3	4	5
11. There are things that I try not to think about.	1	2	3	4	5
12. Sometimes I really wish I could stop thinking.	1	2	3	4	5
13. I often do things to distract myself from my thoughts.	1	2	3	4	5
14. I have thoughts that I try to avoid.	1	2	3	4	5
15. There are many thoughts that I have that I don't tell anyone.	1	2	3	4	5

APPENDIX S1

Stroop Stimuli: Colour – Target Words

pink	orange	blue	black	green	black
green	blue	pink	orange	black	green
blue	black	orange	pink	orange	green
pink	orange	pink	blue	black	green
green	blue	orange	black	green	pink
pink	orange	black	blue	pink	green
blue	pink	green	orange	blue	black
green	black	blue	pink	orange	black
blue	green	orange	black	blue	pink
pink	black	pink	blue	orange	green
black	green	orange	pink	black	orange
black	pink	green	blue	orange	black
orange	black	pink	orange	blue	green
blue	orange	black	pink	green	blue
green	blue	pink	green	black	orange
black	orange	green	pink	blue	black

APPENDIX S3

Stroop Stimuli: Social – Target Words

boring	stupid	foolish	inferior	failure	stupid
stupid	inferior	boring	stupid	foolish	failure
failure	boring	foolish	inferior	stupid	foolish
foolish	inferior	stupid	boring	foolish	failure
failure	boring	foolish	inferior	stupid	boring
foolish	stupid	boring	failure	inferior	failure
failure	inferior	stupid	foolish	boring	inferior
foolish	boring	failure	stupid	inferior	failure
boring	failure	inferior	foolish	boring	stupid
failure	inferior	stupid	boring	foolish	inferior
foolish	boring	inferior	stupid	boring	failure
failure	inferior	foolish	boring	failure	stupid
stupid	foolish	failure	inferior	stupid	boring
failure	boring	inferior	foolish	failure	stupid
boring	foolish	boring	failure	stupid	inferior
inferior	stupid	foolish	inferior	boring	failure

APPENDIX S4

Stroop Stimuli: Social – Control Words

portion	obsidian	network	metric	insert	network
metric	insert	portion	network	obsidian	portion
obsidian	network	metric	obsidian	portion	insert
metric	obsidian	portion	insert	network	metric
portion	insert	metric	obsidian	portion	network
insert	metric	portion	insert	network	obsidian
obsidian	portion	insert	metric	obsidian	network
metric	obsidian	portion	network	insert	metric
obsidian	insert	network	obsidian	metric	portion
network	obsidian	metric	portion	network	insert
insert	network	portion	metric	obsidian	network
metric	obsidian	network	portion	insert	metric
portion	network	insert	obsidian	metric	network
obsidian	metric	network	portion	insert	obsidian
portion	insert	obsidian	metric	network	portion

APPENDIX S5

Stroop Stimuli: Physical – Target Words

insane	illness	doctor	insane	fatal	hospital
illness	fatal	insane	doctor	illness	doctor
hospital	insane	doctor	illness	fatal	hospital
doctor	fatal	illness	hospital	insane	illness
insane	illness	hospital	doctor	fatal	insane
hospital	fatal	insane	illness	doctor	fatal
fatal	insane	hospital	doctor	fatal	illness
insane	fatal	doctor	illness	hospital	doctor
fatal	illness	hospital	insane	doctor	fatal
insane	fatal	doctor	illness	insane	hospital
illness	hospital	insane	fatal	illness	doctor
hospital	illness	fatal	doctor	hospital	insane
doctor	insane	illness	insane	fatal	hospital
hospital	fatal	doctor	illness	hospital	insane
fatal	hospital	illness	doctor	insane	fatal
hospital	doctor	insane	fatal	illness	doctor

APPENDIX S6

Stroop Stimuli: Physical – Control Words

defied	upward	leaning	reported	rayon	reported
rayon	defied	reported	leaning	upward	leaning
defied	reported	leaning	defied	rayon	upward
reported	rayon	upward	rayon	leaning	defied
leaning	upward	rayon	defied	rayon	reported
reported	rayon	defied	upward	leaning	defied
upward	reported	leaning	defied	rayon	leaning
leaning	defied	rayon	leaning	upward	reported
upward	rayon	upward	defied	reported	leaning
defied	upward	defied	rayon	leaning	reported
upward	leaning	rayon	reported	defied	upward
leaning	defied	upward	rayon	leaning	reported
rayon	leaning	reported	defied	rayon	upward
reported	upward	rayon	leaning	reported	defied
defied	leaning	upward	reported	upward	rayon
reported	rayon	defied	leaning	reported	upward

APPENDIX T
Thought Conviction Measure

In the space below please list 3 thoughts you had about yourself or your performance during the speech. Please indicate the extent you believed each thought on the adjacent scale between 0 (if you do not believe the thought at all), and 10 (if you are completely convinced the thought is true).

Thought (e.g. I'm useless)	Do not believe this thought at all											Completely convinced the thought is true
	0	1	2	3	4	5	6	7	8	9	10	
	0	1	2	3	4	5	6	7	8	9	10	
	0	1	2	3	4	5	6	7	8	9	10	

APPENDIX U
Trait Meta Mood Scale

Please indicate the extent to which you agree or disagree with statements below.

	strongly disagree	disagree	neutral	agree	strongly agree
1. I try to think good thoughts no matter how badly I feel. [R]	1	2	3	4	5
2. People would be better off if they felt less and thought more. [A](r)	1	2	3	4	5
3. I don't think it's worth paying attention to your emotions or moods. [A](r)	1	2	3	4	5
4. I don't usually care much about what I'm feeling. [A](r)	1	2	3	4	5
5. Sometimes I can't tell what my feelings are. [C](r)	1	2	3	4	5
6. I am rarely confused about how I feel. [C]	1	2	3	4	5
7. Feelings give direction to life.[A]	1	2	3	4	5
8. Although I am sometimes sad I have a mostly optimistic outlook. [R]	1	2	3	4	5
9. When I am upset I realize the "good things in life" are illusions. [R](r)	1	2	3	4	5
10. I believe in acting from the heart. [A]	1	2	3	4	5
11. I can never tell how I feel. [C](r)	1	2	3	4	5
12. The best way for me to handle my feelings is to experience them to the fullest. [A]	1	2	3	4	5
13. When I become upset I remind myself of all the pleasures in life. [R]	1	2	3	4	5
14. My belief and opinions always seem to change depending on how I feel. [C](r)	1	2	3	4	5
15. I am often aware of my feelings on a matter. [C]	1	2	3	4	5
16. I am usually confused about how I feel. [C](r)	1	2	3	4	5
17. One should never be guided by emotions. [A](r)	1	2	3	4	5
18. I never give in to my emotions. [A](r)	1	2	3	4	5

19. Although I am sometimes happy, I have a mostly pessimistic outlook. [R](r)	1	2	3	4	5
20. I feel at ease about my emotions. [C]	1	2	3	4	5
21. I pay a lot of attention to how I feel. [A]	1	2	3	4	5
22. I can't make sense out of my feelings. [C] (r)	1	2	3	4	5
23. I don't pay much attention to my feelings.[A] (r)	1	2	3	4	5
24. I often think about my feelings. [A]	1	2	3	4	5
25. I am usually very clear about my feelings. [A]	1	2	3	4	5
26. No matter how badly I feel, I try to think about pleasant things. [R]	1	2	3	4	5
27. Feelings are a weakness humans have. [A] (r)	1	2	3	4	5
28. I usually know my feelings about a matter. [C]	1	2	3	4	5
29. It is usually a waste of time to think about your emotions. [A] (r)	1	2	3	4	5
30. I almost always know exactly how I am feeling. [C]	1	2	3	4	5

(r) = reverse scored items

Factors

[A] = attention to feelings

[C] = clarity of feelings

[R] = mood repair

APPENDIX V
Self Statements During Public Speaking Scale

Try to recall what you felt and thought during the public speaking situation. How much do you agree with the statements given below. Please rate the degree of your agreement on a scale between 0 (if you do not agree at all) to 5 (if you agree extremely with the statement).

		Do not agree at all					Agree extremely
		0	1	2	3	4	5
1.	What do I have to lose it's worth a try. (P)	0	1	2	3	4	5
2.	I'm a loser. (N)	0	1	2	3	4	5
3.	This is an awkward situation but I can handle it. (P)	0	1	2	3	4	5
4.	A failure in this situation would be proof of my incapacity. (N)	0	1	2	3	4	5
5.	Even if things don't go well, it's no catastrophe. (P)	0	1	2	3	4	5
6.	I can handle everything. (P)	0	1	2	3	4	5
7.	What I say will probably sound stupid. (N)	0	1	2	3	4	5
8.	I'll probably "bomb out" anyway. (N)	0	1	2	3	4	5
9.	Instead of worrying I could concentrate on what I want to say. (P)	0	1	2	3	4	5
10.	I feel awkward and dumb; they're bound to notice. (N)	0	1	2	3	4	5

(P) positive self-statements (N) negative self-statements

APPENDIX W
Evaluations of Intervention Efficacy

To what extent do you think practicing your technique prior to the speech helped with the following?

	Not at all											Extremely
1. Feel less anxious while you were waiting to speak.	0	1	2	3	4	5	6	7	8	9	10	
2. Feel less anxious during the speech	0	1	2	3	4	5	6	7	8	9	10	
3. Perform better on the speech	0	1	2	3	4	5	6	7	8	9	10	

APPENDIX X
Evaluation of the Technique and Training

Please indicate the extent to which you agree or disagree with the following statements about the technique that you learned.

	strongly disagree	disagree	neutral	agree	strongly agree
1. I enjoyed learning the technique.	1	2	3	4	5
2. The technique was taught in a way that I could understand.	1	2	3	4	5
3. The CD and handbook helped me understand and practice my technique.	1	2	3	4	5
4. This technique has helped me manage my anxiety over the last four weeks.	1	2	3	4	5
5. I will continue practicing this technique after my involvement with the study is over.	1	2	3	4	5
6. I would recommend this technique to other people.	1	2	3	4	5

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